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DENOV TADBIRKORLIK VA PEDAGOGIKA INSTITUTI



TADBIRKORLIK VA BOSHQARUV FAKULTETI
AXBOROT TEXNOLOGIYALARI KAFEDRASI

60110600-Matematika va informatika yo‘nalishiga

YAKUNIY DAVLAT ATTESTATSIYASI
TEST SAVOLLARI

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YAKUNIY DAVLAT ATTESTATSIYASI TEST SAVOLLARI

1. $\operatorname{Im} z = 0$ nuqtalarning geometrik o‘rnini toping.
 - a) $\{x = 0\}$ – yarim tekislik.
 - b) $\{y = 0\}$ yarim tekislik.
 - c) $*\{y = 0\}$ – yarim tekislik
 - d) $\{x = 0\}$ yarim tekislik.
2. $1 < |z - 1| < 3$ nuqtalarning geometrik o‘rnini toping.
 - a) Markazi $z = 1$ nuqtada radiusi 2 bo‘lgan doira.
 - b) Markazi $z = 1$ nuqtada radiusi 3 bo‘lgan doira.
 - c) Markazi $z = 1$ nuqtada radiusi 3 bo‘lgan ochiq doira.
 - d) *Markazlari $z = 1$ nuqtada radiuslari 1 va 3 bo‘lgan xalqa
3. $z = 1 - it$ ($0 \leq t \leq 2$) funksiya aniqlagan egri chiziqni toping.
 - a) $\{x = -1, -2 \leq y \leq 0\}$
 - b) $\{x = 1, 0 \leq y \leq 2\}$
 - c) $*\{x = 1: -2 \leq y \leq 0\}$
 - d) $\{x = -1, 0 \leq y \leq 2\}$
4. $\lim_{n \rightarrow \infty} \frac{a^n}{1 + a^{2n}} + 1$ ni hisoblang.
 - a) 2
 - b) 0
 - c) *1
 - d) $1\frac{1}{2}$
5. Kompleks tekislikning birinchi kvadratini tengsizlik yordamida yozing.
 - a) $\{\operatorname{Re} z \geq 0: \operatorname{Im} z < 0\}$
 - b) $*\{\operatorname{Re} z > 0: \operatorname{Im} z > 0\}$
 - c) $\{\operatorname{Re} z < 0: \operatorname{Im} z > 0\}$
 - d) $\{\operatorname{Re} z < 0: \operatorname{Im} z < 0\}$
6. $z = R e^{it}$ ($0 \leq t \leq \frac{\pi}{2}$, $R > 0$) funksiya aniqlagan egri chiziqni toping.
 - a) $*\{|z| = R\}$, $\operatorname{Re} z \geq 0$, $\operatorname{Im} z \geq 0$
 - b) $\{|z| = R\}$ aylana.
 - c) $\{|z| = R: \operatorname{Re} z \geq 0\}$ aylana.

d) $\{z \mid |z| = R, \operatorname{Im} z = 0\}$ aylana.

7. Amallarni bajaring. $(1+i)^{10}$

- a) 32
- b) $*32i$
- c) $\frac{\pi}{2}$
- d) $-32i$

8. $z = \frac{1-i}{1+i}$ sonning argumentini toping.

- a) $\arg z = \frac{2\pi}{3}$
- b) $*\arg z = \frac{3\pi}{2}$
- c) $\arg z = \frac{3\pi}{4}$
- d) $\arg z = \frac{\pi}{3}$

9. $z = -1 + i\sqrt{3}$ sonni trigonometrik shaklda tasvirlang.

- a) $z = \cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3}$
- b) $z = -2 \cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3}$
- c) $*z = 2(\cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3})$
- d) $z = 2 \sin \frac{2\pi}{3} + i \cos \frac{2\pi}{3}$

10. $\lim_{n \rightarrow \infty} \frac{n}{2n+1} = \frac{1}{2}$. Agar $\varepsilon = 0,001$ bo'lsa, $\left| \frac{n}{2n+1} - \frac{1}{2} \right| < \varepsilon$ tengsizlik o'rinli

bo'ladigan $n \in \mathbb{N}$ ning eng kichik qiymatini toping.

- a) 249
- b) 248
- c) 150
- d) $*250$

11. Quyidagi jumlaning qaysi biri to'g'ri?

- a) Quyidan chegaralangan ixtiyoriy X sonli to'plam eng kichik elementga ega
- b) $*Chegaralangan X$ sonli to'plam aniq yuqori va aniq quyi chegaraga ega
- c) Quyidan chegaralangan ixtiyoriy X sonli to'plam eng katta elementga ega
- d) Chegaralangan ixtiyoriy X sonli to'plam eng katta va eng kichik elementga ega

12. Quyidagi jumalarning qaysi biri to'g'ri?

- a) agar $x_n \leq y_n$ ($n=1,2,\dots$) bo'lib, $\lim_{n \rightarrow \infty} x_n$ chekli bo'lsa, u holda $\lim_{n \rightarrow \infty} y_n$ ham chekli bo'ladi.
- b) $*agar x_n$ ketma-ketlik o'suvchi, y_n ketma-ketlik kamayuvchi, $x_n \leq y_n$

($n=1,2,\dots$) bo'lib, $\lim_{n \rightarrow \infty} (y_n - x_n) = 0$ bo'lsa, u holda $\lim_{n \rightarrow \infty} x_n = \lim_{n \rightarrow \infty} y_n$ bo'ladi.

c) agar $x_n \leq y_n$ ($n=1,2,\dots$) bo'lib, $\lim_{n \rightarrow \infty} y_n$ chekli bo'lsa, u holda $\lim_{n \rightarrow \infty} x_n$ ham chekli bo'ladi.

d) agar $x_n \leq y_n$ ($n=1,2,\dots$) bo'lsa, u holda har doim $\lim_{n \rightarrow \infty} x_n = \lim_{n \rightarrow \infty} y_n$ bo'ladi.

13. $\lim_{n \rightarrow \infty} a_n = a$ degani bu

a) a nuqtaning shunday atrofi topilib, bu atrofga $\{a_n\}$ ketma-ketlikning faqat chekli sondagi hadlari tegishli

b) a nuqtaning ixtiyoriy atrofida $\{a_n\}$ ketma-ketlikning hadlari mavjud emas

c) a nuqtaning ixtiyoriy atrofida $\{a_n\}$ ketma-ketlikning faqat chekli sondagi hadlari mavjud

d) a nuqtaning shunday atrofi topilib, bu atrofga tegishli bo'lmagan $\{a_n\}$ ketma-ketlikning cheksiz ko'p hadlari mavjud

14. Quyidagi limitlarni toping. $\lim_{n \rightarrow \infty} \frac{\sqrt{n^2 + 1}}{3n + 1}$ va $\lim_{n \rightarrow \infty} \frac{1 - 3n}{\sqrt{n^4 + 1}}$

a) $1/3$ va -3

b) 1 va 0

c) $1/3$ va 0

d) 3 va 0

15. Quyidagi formulalarning qaysi biri xato?

a) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$

b) $\lim_{x \rightarrow 0} (1 + x)^{\frac{1}{x}} = e$

c) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 0$

d) $\lim_{n \rightarrow \infty} 1 + \frac{1}{n} = e$

16. Shartga mos to'g'ri xulosani ko'rsating: Agar $\lim_{x \rightarrow a} f(x) = b < 0$ bo'lsa,

a) a nuqtaning shunday atrofi mavjud bo'lib, bunda funksiyaning qiymatlari b dan kichik bo'ladi.

b) a nuqtaning ixtiyoriy atrofida funksiya manfiy qiymatlarni qabul qiladi.

c) a nuqtaning shunday atrofi mavjud bo'lib, bunda funksiya manfiy qiymatlar qabul qiladi.

d) a nuqtaning ixtiyoriy atrofida $f(x) < b$ bo'ladi.

17. Quyidagi ketma-ketliklarning qaysilari uzoqlashuvchi? 1) $x_n = n^3$, 2) $x_n = \frac{n+1}{n}$,

3) $x_n = \frac{n^2 + 1}{n + 1}$

a) $1, 2$

b) $1, 3$

- c) 2, 3
- d) 1,2,3

18. Quyidagi mulohazalardan qaysi biri noto'g'ri?

- a) *Chegaralanmagan ketma-ketlik cheksiz katta ketma-ketlikdir
- b) Cheksiz katta ketma-ketlik chegaralanmagan ketma-ketlikdir
- c) Agar $\{x_n\}$ cheksiz katta ketma-ketlik bo'lsa, $\{1/x_n\}$ chegaralangan ketma-ketlik bo'ladi
- d) Agar $\{x_n\}$ cheksiz katta ketma-ketlik bo'lsa, $\{1/x_n\}$ cheksiz kichik ketma-ketlik bo'ladi

$$-x-3, \text{ agar } x < -1 \text{ bo'lsa,}$$

19. Funksiyaning uzilish nuqtalarini toping. $y = 0, \text{ agar } -1 < x < 0 \text{ bo'lsa,}$

$$\sqrt{x}, \text{ agar } x \geq 0 \text{ bo'lsa}$$

- a) $x=0$
- b) $x=-1$
- c) $x=-1, x=0$
- d) $x=-3$

20. $Ax + By + C = 0$ ko'rinishdagi tenglama qanday ataladi?

- a) To'g'ri chiziqning burchak koeffitsientli tenglamasi
- b) To'g'ri chiziqning normal tenglamasi
- c) *Tekislikda to'g'ri chiziqning umumiy tenglamasi
- d) To'g'ri chiziqning kesmalar bo'yicha tenglamasi

21. To'g'ri chiziqning umumiy tenglamasi $Ax + By + C = 0$ da x va y

o'zgaruvchilar oldidagi koeffitsientlar qanday geometrik ma'noga ega.

- a) *To'g'ri chiziq normal vektorining koordinatalari
- b) To'g'ri chiziq yo'naltiruvchi vektorining koordinatalari
- c) To'g'ri chiziqning Ox va Oy o'qlaridan ajratgan kesmalarining uzunliklari
- d) Ixtiyoriy koordinatalar

22. $Ax + By = 0, A \neq 0, B \neq 0$ tenglama bilan berilgan to'g'ri chiziq tekislikda koordinata sistemasiga nisbatan qanday joylashgan.

- a) to'g'ri chiziq Oy o'qiga parallel
- b) *to'g'ri chiziq koordinata boshidan o'tadi
- c) to'g'ri chiziq Ox o'qiga parallel
- d) to'g'ri chiziq Ox o'qi bilan ustma-ust tushadi

23. $Ax + B = 0, B \neq 0$ tenglama bilan berilgan to'g'ri chiziq tekislikda koordinata sistemasiga nisbatan qanday joylashgan.

- a) to'g'ri chiziq Oy o'qi bilan ustma-ust tushadi
- b) to'g'ri chiziq Ox o'qi bilan ustma-ust tushadi
- c) to'g'ri chiziq koordinata boshidan o'tadi
- d) *to'g'ri chiziq Oy o'qiga parallel

24. $\frac{x}{a} + \frac{y}{b} = 1$ tenglama to'g'ri chiziqning qanday ko'rinishdagi tenglamasi

deyiladi ?

- a) Kanonik ko'rinishdagi tenglamasi
- b) To'g'ri chiziqning umumiy tenglamasi
- c) *To'g'ri chiziqning kesmalarga nisbatan tenglamasi
- d) Burchak koefisientli tenglamasi

25. $\frac{x-x_1}{m} = \frac{y-y_1}{n}$ tenglama to'g'ri chiziqning qanday ko'rinishdagi tenglamasi

deyiladi, m, n sonlar qanday geometrik ma'noga ega.

- a) *To'g'ri chiziqning kanonik tenglamasi, m va n yo'naltiruvchi vektorning koordinatalari
- b) To'g'ri chiziqning kanonik tenglamasi, m va n normal vektorining koordinatalari
- c) To'g'ri chiziqning parametrik tenglamasi, m va n – haqiqiy sonlar
- d) To'g'ri chiziqning burchak koefisientli tenglamasi, m va n haqiqiy sonlar

26. $\frac{x-x_1}{x_2-x_1} = \frac{y-y_1}{y_2-y_1}$ ko'rinishdagi tenglama qanday ataladi?

- a) To'g'ri chiziqning kanonik tenglamasi
- b) *Berilgan ikki nuqtadan o'tuvchi to'g'ri chiziq tenglamasi
- c) To'g'ri chiziqning kesmalarga nisbatan tenglamasi
- d) To'g'ri chiziqning parametrik tenglamasi

27. To'g'ri chiziqning parametrik tenglamalari ... ko'rinishga ega

- a) $\frac{x-x_1}{x_2-x_1} = \frac{y-y_1}{y_2-y_1}$
- b) $\frac{x}{a} + \frac{y}{b} = 1$
- c) $y = kx + b$
- d) * $\begin{cases} x = x_0 + tm \\ y = y_0 + tn \end{cases}$

28. $y = kx + b$ ko'rinishdagi tenglama to'g'ri chiziqning qanday ko'rinishdagi tenglamasi va k, b sonlar qanday geometrik ma'noga ega?

- a) To'g'ri chiziqning burchak koefisientli tenglamasi, k son to'g'ri chiziqning Ox o'qi bilan tashkil kilgan burchak kotangensiga teng, b son to'g'ri chiziqning Ox o'qidan ajratgan kesmasi
- b) *To'g'ri chiziqning burchak koefisientli tenglamasi, k son to'g'ri chiziqning Ox o'qi bilan tashkil kilgan burchak tangensiga teng, b son to'g'ri chiziqning Oy o'qidan ajratgan kesmasi
- c) To'g'ri chiziqning burchak koefisientli tenglamasi, $k = \cos \varphi$, b ixtiyoriy son
- d) To'g'ri chiziqning parametrik tenglamasi, $k = \operatorname{ctg} \varphi$, b to'g'ri chiziqning Oy o'qidan ajratgan kesmasining uzunligi

29. $z = \frac{1}{1-i} + \frac{1}{1-i}$ sonning haqiqiy va mavhum qismlarini toping.

- a) * $\operatorname{Re} z = 1; \operatorname{Im} z = 0$

- b) $\operatorname{Re} z = e; \operatorname{Im} z = 0$
- c) $\operatorname{Re} z = 1; \operatorname{Im} z = 1$
- d) $\operatorname{Re} z = -1; \operatorname{Im} z = -2$

30. $z^2 = 3 - 4i$ tenglamani eching.

- a) $\emptyset$
- b) $z_{1,2} = \pm(2 + i)$
- c) $z_{1,2} = (2 - i)$
- d) $*z_1 = 2 - i, z_2 = -2 + i$

31. $\sqrt{3 + 4i}$ ning barcha qiymatlarini toping.

- a) $2 + i$
- b) $*\pm(2 + i)$
- c) $\pm(2 - i)$
- d) $\pm(i - 2)$

32. Haqiqiy o'qdan yuqorida va undan 2 birlik masofa uzoqlikda joylashgan yarim tekislik.

- a) $*\{ \operatorname{Im} z \geq 2 \}$
- b) $\{ \operatorname{Re} z \leq 2 \}$
- c) $\{ \operatorname{Im} z \leq 2 \}$
- d) $\{ \operatorname{Re} z \geq 2 \}$

33. $|z| - z = 1 + 2i$ tenglamani yeching.

- a) $3 - 2i$
- b) $*z = \frac{3}{2} - 2i$
- c) $\frac{1}{2} - 2i$
- d) $\frac{3}{2} + 2i$

34. $\sqrt[4]{-1}$ ning barcha qiymatlarini toping.

- a) $\pm \frac{\sqrt{2}}{2}(1 - i)$
- b) $\pm \frac{\sqrt{2}}{2}(1 + i)$
- c) $*\pm \frac{\sqrt{2}}{2}(1 \pm i)$
- d) $\emptyset$

35. $W = z^{-2}$ akslantirishning $z_0 = i$ nuqtadagi burilish burchagi $\alpha(\varphi)$ ni toping.

- a) $\alpha(\varphi) = \varphi - \pi$
- b) $\alpha(\varphi) = \frac{\pi}{2}$
- c) $\alpha(\varphi) = \pi$

1. Riman sferasidagi shimoliy qutubidagi R nuqta C_z tekislikda qaysi nuqtaga akslanadi.

- a) $z=0$ nuqtaga
- b) $z=\infty$ nuqtaga
- c) $z=z_0$ nuqtaga
- d) $z=-\infty$ nuqtaga

2. $w = z^2 + 2z$ funksiya yordamida akslantrishda z tekislikning qaysi qismi kenggayib akslanadi.

- a) $|z + 1| > \frac{1}{2}$
- b) $|z + 1| = \frac{1}{2}$
- c) $|z + 1| < \frac{1}{2}$
- d) $z + 1 > \frac{1}{2}$

3. $w=z^2+2z$ funksiya yordamida akslantrishda z tekislikning qaysi qismi torayib akslanadi.

- a) $|z + 1| = \frac{1}{2}$
- b) $|z + 1| < \frac{1}{2}$
- c) $|z + 1| > \frac{1}{2}$
- d) $z + 1 > \frac{1}{2}$

4. $\cos(2+i)$ sonining haqiqiy qismini toping.

- a) $\sin 1 \operatorname{sh} 1 \cdot \cos 2$
- b) $\cos 2$
- c) $\operatorname{ch} 1 \cdot \cos 2$
- d) $\sin 2 \cdot \sin 1$

5. $\operatorname{Re} f(z) = x \cdot \cos x \cdot \operatorname{ch} y + y \cdot \sin x \cdot \operatorname{sh} y$, $f(0) = 0$ bo'lsin. U holda $f(z)$ holomorf funktsiyani toping:

- a) $z \cdot \cos z$
- b) $z \cdot \sin z$,
- c) $z \cdot \cosh z$
- d) $z \cdot \sinh z$

6. $1/\sin^2 z$ funktsiyaning $z = 0$ nuqtadagi qoldig'ini toping.

- a) 1
- b) $1/2$
- c) 0
- d) -1

7. Agar harqanday kichik $\varepsilon > 0$ uchun shunday kichik $\delta > 0$ ni ko'rsatish mumkin bo'lsaki, $|\Delta z| < \delta$ bo'lganda $|\Delta W| < \varepsilon$ bo'lsa $f(z)$ funksiya z_0 nuqtada

- a) Chegaralangan
- b) Uzluksiz
- c) Chegaralanmagan
- d) Uzulishga ega deyiladi

8. $W = \sqrt[3]{z}$ funksiya necha qiymatli.

- a) uch qiymatli
- b) ikki qiymatli
- c) bir qiymatli
- d) To'rt qiymatli

9. $D = \{z - 1 | z| < 2\}$ sohani $w = 1 - 2iz$ akslantirish yordamidagi aksini toping.

- a) $\{w - 1 + 2i | w| < 4\}$
- b) $\{w - 1 + 2i | w| < 2\}$
- c) $\{w - 1 - 2i | w| < 4\}$

d) $\{w-1-2i|<2\}$

10. $D = \{0 \leq \operatorname{Re} z < 1\}$ sohani $w = 2iz + 1 - i$ akslantirish yordamidagi aksini toping.

a) $\{0 < \operatorname{Im} z < 1\}$

b) $\{-1 < \operatorname{Im} z < 1\}$

c) $\{-1 < \operatorname{Im} z < 0\}$

d) $\{-2 < \operatorname{Im} z < 2\}$

11. $x=0$ to'plamning $w = \frac{1}{z}$ akslantirish yordamidagi aksini toping.

a) $U = 0$

b) $V = 0$

c) $U = 1$

d) $V = 1$

12. Fazoda to'g'ri chiziqning vektor shaklidagi tenglamasi quyidagi tenglamalardan qaysi biri bo'ladi?

a) $V=1$

b) $V = 0$

c) $U = 0$

d) $y=0$ to'plamning $w = \frac{1}{z}$ akslantirish yordamidagi aksini toping.

e) $U = 1$

13. Quyidagi funksiyalarning qaysi biri o'zining aniqlanish sohasida quyidan chegaralangan 1) $y = x^2$; 2) $y = \log_a x$; 3) $y = \sin x$; 4) $y = \operatorname{tg} x$

a) 3 va 4

b) 2 va 3

c) 1 va 2

d) 1 va 3

14. Juft funksiyani aniqlang: 1) $f(x) = x^2 \sin x$, 2) $f(x) = x^2 \cos x$; 3) $f(x) = x + x^3$

- a) 3
- b) 1
- c) 2
- d) 1 va 2

15. $y = x^2 - 10x - 11$ funksiyaning qiymatlar to'plamini toping.

- a) $[2; +\infty)$
- b) $(-\infty; +\infty)$
- c) $[9; +\infty)$
- d) $[-36; +\infty)$

16. $y = 5 \sin^2 x$ funksiyaning eng kichik musbat davrini toping.

- a) 1
- b) π
- c) 2π
- d) $2\pi / 5$

17. Quyidagi to'plamlarning qaysi biri a nuqtaning ε atrofi bo'ladi.

- a) $(a - \varepsilon; a]$
- b) $[a; a + \varepsilon)$
- c) $(a - \varepsilon / 2; a + \varepsilon / 2)$
- d) $(a - \varepsilon; a + \varepsilon)$

18. $\lim_{n \rightarrow \infty} 1 + \frac{1}{3n}^{2n}$ limitni toping.

- a) $-e^6$
- b) $-e^3$
- c) $+e^{2/3}$
- d) $-e$

19. $\lim_{x \rightarrow} \frac{x^3 - 3x + 2}{x^4 - 4x + 3}$ ni hisoblang.

- a) $2/3$
- b) 0
- c)
- d) 10

20. $\lim_{x \rightarrow 4} \frac{3 - \sqrt{5+x}}{1 - \sqrt{5-x}}$ ni hisoblang.

- a) $2/3$
- b) $-1/3$
- c) 2
- d) -3

21. Limitni toping $\lim_{x \rightarrow 2} \frac{x^2 - 6x + 8}{x^2 - 3x + 2}$

- a) -2
- b) 6
- c) -3
- d) 4

22. Quyidagi jummlarning qaysi biri xato?

- a) $[a; b]$ segmentda uzluksiz funksiya shu segmentda chegaralangan bo'ladi.
- b) $[a; b]$ segmentda uzluksiz funksiya shu segmentda tekis uzluksiz bo'ladi.
- c) $[a; b]$ segmentda uzluksiz funksiyaning qiymatlar to'plami ham segment bo'ladi.
- d) $[a; b]$ segmentda uzluksiz bo'lgan funksiya shu segmentda monoton bo'ladi.

23. Agar $\{x_n\}$ ketma-ketlik uchun $\forall M \in R, \exists n_0 \in N: x_{n_0} > M$ bo'lsa, ketma-ketlik deyiladi.

- a) yuqoridan chegaralanmagan
- b) quyidan chegaralanmagan
- c) yuqoridan chegaralangan

d) quyidan chegaralangan

24. Agar shunday o'zgarmas M soni mavjud bo'lsaki, ixtiyoriy x_n ($n = 1, 2, 3, \dots$) uchun x_n M tengsizlik bajarilsa, $\{x_n\}$ ketma-ketlik deyiladi.

a) quyidan chegaralangan

b) yuqoridan chegaralangan

c) yuqoridan chegaralanmagan

d) quyidan chegaralanmagan

25. Agar $f(x) + \frac{1}{x} = x^2 + \frac{1}{x^2}$ bo'lsa, $f(x)$ ni toping.

a) x^2+1

b) x^2-1

c) x^2-2

d) $x+2$

26. $Ax + By + Cz + D = 0$ tekislikning umumiy tenglamasida A, B, C koeffitsientlar qanday geometrik ma'noga ega?

a) Tekislik yo'naltiruvchi vektorining koordinatlari

b) Tekislikning normal vektorining koordinatlari

c) Tekislikda joylashgan vektorning koordinatlari

d) Tekislikka parallel vektorning koordinatalari

27. $Ax + By + Cz = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday joylashgan?

a) Oz o'qiga parallel

b) Oy o'qiga parallel

c) Ox o'qiga parallel

d) Koordinata boshidan o'tadi

28. $By + Cz + D = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday joylashgan?

a) Oy o'qiga parallel

- b) Oz o'qiga parallel
- c) Ox o'qiga parallel
- d) Koordinata boshi orqali o'tadi

29. $Cz + D = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday joylashgan?

- a) Oy o'qiga parallel
- b) Ox o'qiga parallel
- c) Koordinata boshidan o'tadi
- d) xOy koordinata tekisligiga parallel

30. Tenglamasi $By + D = 0$ bo'lgan tekislik koordinata tekisliklariga nisbatan qanday joylashgan?

- a) xOz koordinata tekisligiga parallel
- b) yOz koordinata tekisligiga parallel
- c) xOy koordinata tekisligiga parallel
- d) Oy o'qiga parallel

31. $Ax + D = 0$ tenglama bilan berilgan tekislik koordinata tekisliklariga nisbatan qanday joylashgan?

- a) yOz koordinata tekisligiga parallel
- b) Ox o'qiga parallel
- c) yOx koordinata tekisligiga parallel
- d) xOz koordinata tekisligiga parallel

32. $Cz = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday joylashgan?

- a) Oy o'qidan iborat
- b) xOz koordinata tekisligi bilan ustma-ust tushadi
- c) xOy koordinata tekisligi bilan ustma-ust tushadi
- d) Ox o'qidan iborat

33. $By = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday

joylashgan?

- a) xOz tekisligidan iborat
- b) xOy tekisligidan iborat
- c) Ox o'qidan iborat
- d) Oy o'qidan iborat

34. $Ax = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday joylashgan?

- a) xOy tekisligi bo'ladi
- b) Oy o'qidan iborat bo'ladi
- c) Ox o'qidan iborat bo'ladi
- d) yOz tekisligi bo'ladi

35. $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$ ko'rinishdagi tenglama qanday ataladi va a, b, c sonlar qanday geometrik ma'noga ega?

- a) Tekislikning kesmalariga nisbatan tenglamasi, a, b, c -sonlar mos ravishda, Ox, Oy, Oz o'qlardan ajratgan kesmalarining kattaliklari
- b) Tekislikning umumiy tenglamasi; a, b, c - ixtiyoriy sonlar

1. e^z ning $z = \pi i$ dagi qiymatini toping.

- a) -1
- b) *1
- c) i
- d) $-i$

2. $w = e^z$ akslantirish yordamida $Re z = 1$ ning aksini toping.

- a) $|w| = i$
- b) $|w| = 1$
- c) $*|w| = e$
- d) $w = e^2$

3. $w = e^z$ akslantirish yordamida $Im z = \frac{\pi}{2}$ ning aksini toping.

a) $\ast arg w = \frac{\pi}{2}$

b) $arg w = \pi$

c) $arg w = \frac{\pi}{2}$

d) $arg w = \frac{\pi}{2}$

4. Gyolder shartini aniqlang.

a) $\ast_0 |\varphi(z_1) - \varphi(z_2)| \leq A|z_1 - z_2|^\lambda, 0 < \lambda \leq 1$

b) $|\varphi(z_1) - \varphi(z_2)| \leq A|z_1 - z_2|^\lambda, 0 < \lambda \leq 1$

c) $|\varphi(z_1) - \varphi(z_2)| \leq A|z_1 - z_2|$

d) $|\varphi(z_1) - \varphi(z_2)| \leq |z_1 - z_2|^\lambda, 0 < \lambda \leq 1$

5. Saxodiskiy formulalari

a) $\phi^+(\xi_0) = \phi(\xi_0) + \varphi(\xi_0)$

b) $\phi^+(\xi_0) = \phi(\xi_0) - \frac{1}{2}\varphi(\xi_0)$

c) $\ast \phi^+(\xi_0) = \phi(\xi_0) + \frac{1}{2}\varphi(\xi_0)$

d) $\phi(\xi_0) = \phi(\xi_0) + \frac{1}{2}\varphi(\xi_0)$

6. Koshi integral formulasi

a) $\phi(z) = \frac{1}{2\pi i} \oint_c \frac{\varphi(\xi)}{\xi} d\xi$

b) $\phi(z) = \frac{1}{2\pi i} \oint_c \frac{1}{\xi - z} d\xi$

c) $\phi(z) = \oint_c \frac{\varphi(\xi)}{\xi - z} d\xi$

d) $\ast \phi(z) = \frac{1}{2\pi i} \oint_c \frac{\varphi(\xi)}{\xi - z} d\xi$

7. Koshi tipidagi integral

a) $\phi(z) = \oint_c \frac{\varphi(\xi)}{\xi - z} d\xi$

$$b) \phi(z) = \frac{1}{2\pi i} \oint_c \frac{1}{\xi - z} d\xi$$

$$c) * \phi(z) = \frac{1}{2\pi i} \oint_c \frac{\varphi(\xi)}{\xi - z} d\xi$$

$$d) \phi(z) = \frac{1}{2\pi i} \oint_c \frac{\varphi(\xi)}{\xi} d\xi$$

8. $f: N \rightarrow C$ akslantirishning akslaridan iborat to'plam

- a) C da akslantirish
- b) C da qator
- c) $*C$ da ketma-ketlik
- d) C da funksiya

9. Ushbu $\sum_{n=0}^{\infty} (\frac{1}{2^n} - \frac{1}{3^n} i)$ qatorning 3-hadi nimaga teng

- a) $* \frac{1}{4} - \frac{1}{9} i$
- b) $\frac{1}{4} + \frac{1}{9} i$
- c) $-\frac{1}{4} - \frac{1}{9} i$
- d) $\frac{1}{4} i - \frac{1}{9}$

10. Ushbu $\sum_{n=0}^{\infty} (\frac{1}{4^n} - \frac{1}{3^n} i)$ qatorning 3-hadi nimaga teng

- a) $-\frac{1}{16} - \frac{1}{9} i$
- b) $-\frac{1}{16} + \frac{1}{9} i$
- c) $* \frac{1}{16} - \frac{1}{9} i$
- d) $\frac{1}{16} i - \frac{1}{9}$

11. Ushbu $\sum_{n=0}^{\infty} (\frac{1}{2^n} - \frac{1}{3^n} i)$ qatorning 1-hadi nimaga teng

- a) $1+i$
- b) $*1-i$
- c) $-1-i$
- d) $i-1$

12. Ushbu $\sum_{n=0}^{\infty} (\frac{1}{2^n} - \frac{1}{4^n} i)$ qatorning 2-hadi nimaga teng

- a) $-\frac{1}{4} - \frac{1}{16} i$
- b) $\frac{1}{4} + \frac{1}{16} i$
- c) $*\frac{1}{4} - \frac{1}{16} i$
- d) $-\frac{1}{4} + \frac{1}{16} i$

13. Teskari funksiyaning hosilasi qaysi javobda to'g'ri berilgan?

- a) $[f^{-1}(y)]_{x_0} = -\frac{1}{f(x_0)}$
- b) $[f^{-1}(y)]_{x_0} = \frac{1}{f(x_0)}$
- c) $*[f^{-1}(y)]_{x_0} = \frac{1}{f(x_0)}$
- d) $[f^{-1}(y)]_{x_0} = -\frac{1}{f(x_0)}$

14. $\sum_{n=1}^{\infty} \ln(1 + \frac{1}{n})$ qatorning xususiy yig'indisini toping.

- a) $\ln n - 1$
- b) $\ln(n+1) - \ln 2$
- c) $*\ln(n+1)$
- d) $-\ln(n+1)$

15. Davri 2π ga teng bo'lgan $f(x) = \begin{cases} 1, & 0 < x < \pi \\ 0, & -\pi < x < 0 \end{cases}$ funksiya uchun a_0 Furiye

koeffitsientini toping.

- a) 0,5
- b) *1
- c) -0,5
- d) 2

16. Trigonometrik qatorni ko'rsating.

- a) $\sum_{n=0}^{\infty} \frac{2 \cos x}{3^n}$
- b) $\sum_{n=0}^{\infty} \frac{2x \cos x}{3^n}$
- c) * $\sum_{n=0}^{\infty} \frac{2 \cos nx}{3^n}$
- d) $\sum_{n=0}^{\infty} \frac{\cos nx^2}{3^n}$

17. $y = x^2/2$, $y = 1/(1+x^2)$ egri chiziqlar bilan chegaralangan figura yuzini hisoblang.

- a) $\pi/2$
- b) $1/3 - \pi/2$
- c) $\pi - 2$
- d) * $\pi/2 - 1/3$

18. $y = x$, $y = 0$, $x = 1$, $x = 3$ chiziqlar bilan chegaralangan figurani Ox o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini hisoblang.

- a) $32\pi/3$
- b) $21,6\pi$
- c) * $26\pi/3$
- d) 16π

19. Agar $a = \int_0^1 e^x dx$, $b = \int_0^1 e^{\sin x} dx$, $c = \int_0^1 e^{\sqrt{x}} dx$ bo'lsa, quyidagilardan qaysi biri o'rinli?

- a) * $b < a < c$

b) $a < b < c$

c) $c < b < a$

d) $a < c < b$

20. Quyidagi qatorlardan qaysi biri uzoqlashuvchi?

a) $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n+5^n}}$

b) $\sum_{n=1}^{\infty} \frac{1}{n^2}$

c) $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n}}$

d) $\sum_{n=1}^{\infty} \frac{1}{5^n}$

21. Quyidagi qatorlardan qaysi biri yaqinlashuvchi?

a) $\sum_{n=1}^{\infty} \frac{n}{n+1}$

b) $\sum_{n=1}^{\infty} \frac{1}{n+2}$

c) $\sum_{n=1}^{\infty} \frac{2^n}{1+7^n}$

d) $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n}+5}$

22. $z = \sqrt{4 - x^2 - 2y^2}$ funksiyaning aniqlanish sohasini toping.

a) yarim o'qlari $a=2$ va $b=\sqrt{2}$ bo'lgan ellips

b) tekislik

c) yarim o'qlari $a=2$ va $b=\sqrt{2}$ bo'lgan ellips va u bilan chegaralangan soha

d) yarim o'qlari $a=4$ va $b=2$ bo'lgan ellips va u bilan chegaralangan soha

23. Quyidagi mulohazalardan qaysi biri to'g'ri?

a) Integrallanuvchi funksiya har doim uzluksiz bo'ladi.

b) Darbuning yuqori yig'indisi har qanday integral yig'indidan kichik

bo'ladi.

c) Darbuning quyi yig'indisi har qanday integral yig'indidan katta bo'ladi.

d) *Darbuning quyi yig'indisi yuqori yig'indidan katta emas.

24. Quyidagi jumladan qaysi biri to'g'ri?

a) Agar $\int_a^b f(x)dx = 0$ bo'lsa, u holda $[a;b]$ kesmada $f(x)=0$ bo'ladi.

b) *Agar $[a;b]$ kesmada $f(x) \geq 0$ bo'lsa, u holda $\int_a^b f(x)dx \geq 0$ bo'ladi.

c) Agar $\int_a^b f(x)dx > 0$ bo'lsa, u holda $[a;b]$ kesmada $f(x) \geq 0$ bo'ladi.

d) Agar $\int_a^b f(x)dx \leq 0$ bo'lsa, u holda $[a;b]$ kesmada $f(x) \leq 0$ bo'ladi

25. Quyidagi munosabatlardan qaysi biri o'rinli?

a) $\left| \int_a^b f(x)dx \right| = \int_a^b |f(x)|dx$

b) * $\left| \int_a^b f(x)dx \right| \leq \int_a^b |f(x)|dx$

c) $\left| \int_a^b f(x)dx \right| \leq \int_a^b f(|x|)dx$

d) $\left| \int_a^b f(x)dx \right| \leq \int_a^b |f(x)|dx$

26. $\int_a^x \frac{1}{1+t^2} dt$ integralning hosilasi quyidagi funksiyalardan qaysi biriga teng

bo'ladi?

a) * $\frac{1}{1+x^2}$

b) $\frac{1}{x^2}$

c) $\arctg x$

d) $-\frac{1}{1+x^2}$

27. $\vec{a} = \{2; 1; 0\}$ va $\vec{b} = \{0; -2; 1\}$ vektorlarga yasalgan parallelogrammning diagonallari orasidagi burchakni toping.

a) 45^0

b) 0^0

c) 60^0

d) $*90^0$

28. $\vec{a} = \{3; 0; -4\}$ va $\vec{b} = \{1; -2; 2\}$ vektorlar orasidagi burchak sinusini toping.

a) $*\frac{2\sqrt{2}}{3}$

b) $\frac{2\sqrt{3}}{3}$

c) $\frac{2}{3}$

d) $\frac{3}{4}$

29. $\vec{a}\vec{b} = 42$ bo'lgan holda, $\vec{a} = \{4; 2; -1\}$, vektorga kollinear $\vec{b}$ vektorni toping.

a) $\vec{b} = \{-4; -2; 1\}$

b) $\vec{b} = \{2; 1; -1\}$

c) $*\vec{b} = \{8; 4; -2\}$

d) $\vec{b} = \{2; 4; -1\}$

30 $\vec{a} = \{-2; -1; 1\}$, $\vec{b} = \{4; -4; 1\}$, $\vec{c} = \{4; -6; 2\}$ vektorlarning aralash ko'paytmasini toping

a) $*0$

b) 6

c) 12

d) 4

31. $\bar{a} = \{-1; 3; 4\}$, $\bar{b} = \{2; 5; 2\}$, $\bar{c} = \{1; 2; 3\}$ vektorlarga yasalgan parallelepepedning hajmini toping.

a) 54

b) 13,5

c) -27

d) *27

32. Parallelogramm uchta uchining koordinatalari berilgan; $A(-2; 3)$, $B(4; -5)$, $C(-3; 1)$ parallelogrammning yuzi nimaga teng.

a) *20

b) 22

c) 16

d) 49

33. $\bar{a} = \{2; -3; -1\}$ vektor oxirining koordinatalari $(1; -1; 2)$ nuqtada bo'lsa, boshining koordinatalarini toping.

a) $*(-1; 2; 3)$

b) $(-1; 3; 2)$

c) $(0; -1; 2)$

d) $(3; 2; -1)$

34. $M(0; -4)$ nuqtaning qutb koordinatasini toping.

a) $4; \frac{\pi}{2}$

b) $4; \frac{\pi}{4}$

c) $* 4; \frac{3\pi}{2}$

d) $(4; 45^0)$

35. $A(-2; 2)$, $M(1; -1)$ nuqtalar berilgan. Koordinata boshidan va AB kesmanin o'rtasidan o'tuvchi to'g'ri chiziq tenglamasini tuzing.

a) $x + 2y = 0$

b) $x - 2y = 0$

c) $*x + y = 0$

d) $x + y = 7$

1. $w = 2\bar{z} - 1$ funksiyaning mavhum qismini toping .

a) $V(x, y) = -2y - 1$

b) $V(x, y) = -2y$

c) $V(x, y) = -2y + 1$

d) $V(x, y) = 2y - 1$

2. $w = 2z^2 - 1$ funksiyaning mavhum qismini toping .

a) $V(x, y) = -2xy - 1$

b) $V(x, y) = 2xy - 1$

c) $V(x, y) = -2xy$

d) $V(x, y) = 2xy$

3. $\int_{\gamma} xdz$ integralni hisoblang bunda , integrallash chizig'i boshi a va oxiri b nuqtada

bo'lgan egri chiziq.

a) $-b - a$

b) $b - a$

c) $a - b$

d) 0

4. $\int_{\gamma} xdz$ integralni hisoblang bunda , integrallash

chizig'I . $\{z \in C : |z| = 1, 0 \leq \arg z < \pi\}$

a) $\frac{i\pi}{2}$

b) $i\pi$

c) $-\frac{i\pi}{2}$

d) $-i\pi$

5. $\oint_C |z|zdz$ integralni hisoblang bunda , integrallash chizig'I . $\{z \in C : |z|=1, \operatorname{Im} z > 0\}$

a) $i\pi$

b) $-i\pi$

c) 0

d) 1

6. Funksiyaning hosilalari uchun quyidagilardan qaysi biri

1. $f(z) = (\sin az) = a \cos az$

o'rinli. 2. $f(z) = (ze^{az}) = \frac{1}{a}(z - \frac{1}{a})e^z$

3. $f(z) = (\cos az) = a \sin az$

a) 1,2

b) 1

c) 1,3

d) 1,2

7. $\oint_{|z|=2} \frac{dz}{z^2+1}$ integralni hisoblang

a) 1

b) π

c) 0

d) -1

8. $\oint_{|z-i|=2} \frac{dz}{z^2+1}$ integralni hisoblang

a) -1

b) 0

c) $-\pi$

d) π

9. $\sum_{n=1}^{\infty} \frac{i^n}{n}$ qatorning dastlabki uchta hadini toping

a) $i, \frac{i}{2}, \frac{i}{3}$

b) $-i, -i/2, -i/3$

c) $i, -i/2, -i/3$

d) $i, i/2, -i/3$

10. $\sum_{n=1}^{\infty} \frac{i^{in\varphi}}{n}$ qatorning birinchi hadini toping

a) e^{φ}

b) $e^{in\varphi}$

c) $\cos \varphi + i \sin \varphi$

d) $-e^{\varphi}$

11. $f(a) = 0$ bo'lsa

a) n -tartibli noli

b) Funksiya a nuqtada uzluksiz

c) a soni $f(z)$ funksiyaning noli

d) a uzilish nuqtasi

12. $w = f(z)$ funksiya $\operatorname{Im} z > 0$ yuqori yarim tekislikni $|w| < 1$ birlik doiraga

$f(i) = 0$, $\arg f'(i) = -\frac{\pi}{2}$ shartlari bilan conform akslantirsin. U

holda $f(2i) = ?$

a) $i/4$

b) $i/2$

c) $1/3$

d) $1/5$

13. $y = 2x^2 - x - 1$ funksiya berilgan. 1) kamayish oraliqlarini; 2) o'sish oraliqlarini aniqlang.

- a) 1) $(- ; 0,25)$, 2) $(0,25;)$
- b) 1) $(-0,25;)$, 2) $(- ; -0,25)$
- c) 1) $(0,25;)$, 2) $(- ; 0,25)$
- d) 1) $(- ; -0,25)$, 2) $(-0,25;)$

14. Ushbu $y = -4x^3 + 12x$ funksiyaning lokal minimumini toping.

- a) 0
- b) -16
- c) -8
- d) 4

15. $f(x) = 3x - x^2$ funksiyaning $[x_0, x_0 + \Delta x]$ kesmadagi orttirmasini toping.

- a) $\Delta f(x_0) = (2x_0 - 3)\Delta x + (\Delta x)^2$
- b) $\Delta f(x_0) = (3 - 2x_0)\Delta x + (\Delta x)^2$
- c) $\Delta f(x_0) = (2x_0 - 3)\Delta x + (\Delta x)^3$
- d) $\Delta f(x_0) = (3 - 2x_0)\Delta x - (\Delta x)^2$

16. Massasi 10 kg bo'lgan jism $s(t) = t^2 + 2t + 3$ qonuniyat bilan to'g'ri chiziqli harakatlanmoqda. Jismning $t=3$ c vaqtdagi kinetik energiyasini aniqlang.

- a) 3200 J
- b) 340 J
- c) 320J
- d) 250 J

17. Quyidagi hollarning qaysi birida $f(x)$ funksiya $(a;b)$ da kamayuvchi bo'ladi?

- a) $(a;b)$ da $f'(x) > 0$
- b) $(a;b)$ da $f'(x) < 0$
- c) $(a;b)$ da $f''(x) < 0$
- d) $(a;b)$ da $f''(x) > 0$

18. Quyidagi hollarning qaysi birida $f(x)$ funksiya $(a;b)$ da qavariq bo'ladi?

- a) $(a;b)$ da $f(x) > 0$
- b) $(a;b)$ da $f(x) < 0$
- c) $(a;b)$ da $f'(x) < 0$
- d) $(a;b)$ da $f'(x) > 0$

19. Quyidagi funksiyalarning qaysi birlari o'z aniqlanish sohasida kamayuvchi

bo'ladi. 1) $f(x) = 3 - 4x$; 2) $f(x) = 1 - x^2$; 3) $f(x) = \sin x$; 4) $f(x) = -x^3$

- a) 2 va 4
- b) 2 va 3
- c) 1 va 3
- d) 1 va 4

20. Agar $f(x) = 2 \sin x - 4\sqrt{3} \cos x$ bo'lsa, $f\left(\frac{\pi}{3}\right)$ ni hisoblang.

- a) 7
- b) -5
- c) $2 + 4\sqrt{3}$
- d) 0

21. Integralni hisoblang: $\int \frac{dx}{1+x^2}$

- a) $\frac{\pi\sqrt{2}}{2}$
- b) π
- c) $\frac{\pi\sqrt{2}}{4}$
- d) 0

22. $f(x) = x + x^3$ funksiyaning hosilasini toping.

- a) $f'(x) = 1 + x^2$
- b) $f'(x) = 1 + 3x^3$

c) $f(x) = 1 + 3x^2$

d) $f(x) = 3 + 3x^2$

23. Agar $F(x)$ funksiya $f(x)$ funksiyaning boshlang'ich funksiyasi bo'lsa, quyidagi formulalardan qaysi biri to'g'ri? ($k \neq 0$)

a) $\int f(kx)dx = kF\left(\frac{1}{k}x\right) + C$

b) $\int f(b-kx)dx = \frac{1}{k}F(b-kx) + C$

c) $\int f(kx)dx = kF(x) + C$

d) $\int f(b-kx)dx = -\frac{1}{k}F(b-kx) + C$

24. $f(x) = x^2$ funksiyaning $M(-1;3)$ nuqtadan o'tuvchi boshlang'ich funksiyasini toping.

a) $F(x) = x^3 + 5/3$

b) $F(x) = x^3/3$

c) $F(x) = x^3/3 + 10/3$

d) $F(x) = x^3/3 + 3$

25. $\sin 3x \cos 3x dx$ ni hisoblang.

a) $\frac{1}{12} \sin 6x + C$

b) $-\frac{1}{12} \cos 6x + C$

c) $-9 \cos x \sin x + C$

d) $\frac{1}{6} \cos 6x + C$

26. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziq va $Ax + By + Cz + D = 0$ tekislik umumiy

nuqtaga ega bo'lmaslik (parallellik) shartini ko'rsating.

a) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

b) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

c) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

d) $\frac{A}{l} = \frac{B}{m} = \frac{C}{n}$

27. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziqning $Ax + By + Cz + D = 0$ tekislikka

perpendikulyarlik shartini ko'rsating.

a) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

b) $\frac{A}{l} = \frac{B}{m} = \frac{C}{n}$

c) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

d) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

28. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziqning $Ax + By + Cz + D = 0$ tekislikda

yotish shartini ko'rsating.

a) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

b) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

c) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

d) $\frac{A}{l} = \frac{B}{m} = \frac{C}{n}$

29. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziqning $Ax + By + Cz + D = 0$ tekislik

bilan bir nuqtada kesishish shartini ko'rsating.

a) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

b) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

c) $Al + Bm + Cn = 0$

d) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

30. $A_1x + B_1y + C_1z + D = 0, A_2x + B_2y + C_2z + D_2 = 0$ va $A_3x + B_3y + C_3z + D_3 = 0$ tenglamalar

bilan berilgan tekisliklarning bir nuqtada kesishish shartini ko'rsating.

a) $\begin{vmatrix} A_1 & B_1 & C_1 \\ A_2 & B_2 & C_2 \\ A_3 & B_3 & C_3 \end{vmatrix} = 0$

b) $\begin{vmatrix} A_1 & B_1 & C_1 \\ A_2 & B_2 & C_2 \\ A_3 & B_3 & C_3 \end{vmatrix} \neq 0$

c) $\frac{A_1}{A_2} = \frac{B_1}{B_2} = \frac{C_1}{C_2}$

d) $\frac{A_1}{A_3} = \frac{B_1}{B_3} = \frac{C_1}{C_3}$

31. $\vec{a}$ va $\vec{b}$ vektorlarning skalyar ko'paytmasi quyidagicha bo'ladi

a) $\vec{a}\vec{b} = |\vec{a}| |\vec{b}| \sin \varphi$

b) $\vec{a}\vec{b} = |\vec{a}| |\vec{b}| \cos \varphi$

c) $\vec{a}\vec{b} = |\vec{a}| |\vec{b}| \operatorname{tg} \varphi$

d) $\vec{a}\vec{b} = |\vec{a}| |\vec{b}| \operatorname{ctg} \varphi$

32. $\vec{a}$ va $\vec{b}$ vektorlar orasidagi burchak quyidagi formula yordamida aniqlanadi:

a) $\cos \varphi = \frac{\vec{a}\vec{b}}{|\vec{a}| |\vec{b}|}$

b) $\sin \varphi = \frac{|\vec{a}| |\vec{b}|}{\sqrt{a^2} \sqrt{b^2}}$

c) $\operatorname{ctg} \varphi = \frac{\vec{a}\vec{b}}{\sqrt{a^2} \sqrt{b^2}}$

$$d) \operatorname{tg} \varphi = \frac{\overline{a} \overline{b}}{|\overline{a}| |\overline{b}|}$$

33. Ixtiyoriy $\overline{a}$ va $\overline{b}$ vektorlar uchun quyidagi munosabatlardan qaysi biri o'rinli.

a) $(ab)^2 > a^2 b^2$

b) $(ab)^2 = a^2 b^2$

c) $(ab)^2 < a^2 b^2$

d) $(ab)^2 = a^2 b^2$

34. Koordinatalari bilan berilgan $\overline{a}$ va $\overline{b}$ vektorlarning vektor ko'paytmasi quyidagicha bo'ladi:

a) $[\overline{a}, \overline{b}] = |\overline{a}| |\overline{b}| \cos \varphi$

b) $\overline{a}, \overline{b} = \sqrt{a_1^2 + a_2^2 + a_3^2} \cdot \sqrt{b_1^2 + b_2^2 + b_3^2} \sin \phi$

c) $\overline{a}, \overline{b} = \sqrt{a_1^2 + a_2^2 + a_3^2} \cdot \sqrt{b_1^2 + b_2^2 + b_3^2} \cos \phi$

d) $\overline{a}, \overline{b} = \vec{i} \begin{vmatrix} a_2 & a_3 \\ b_2 & b_3 \end{vmatrix} - \vec{j} \begin{vmatrix} a_1 & a_3 \\ b_1 & b_3 \end{vmatrix} + \vec{k} \begin{vmatrix} a_1 & a_2 \\ b_1 & b_2 \end{vmatrix}$

35. $\vec{a}$ va $\vec{b}$ vektorlarning vektor ko'paytmasi bo'lgan vektorning uzunligi quyidagiga teng.

a) $|\vec{a}, \vec{b}| = |\vec{a}| |\vec{b}| \sin \varphi$

b) $|\vec{a}, \vec{b}| = |\vec{a}| |\vec{b}| \operatorname{tg} \varphi$

1. $w = f(z)$ funksiya $\operatorname{Im} z > 0$ yuqori yarimtekislikni $|w| < 1$ birlik doiraga

$f(2i) = 0$, $\arg f'(2i) = 0$ shartlari bilan conform akslantirsin. U holda

$f(3i) =$

a) $i/3$

b) $i/2$

c) $i/5$

d) $2/3$

2. $\operatorname{Ref}(z) = x^3 + 6x^2y - 3xy^2 - 2y^3$, $f(0) = 0$ bo'lsin. U holda $f(z)$ holomorf funksiyani toping:

a) $3(z-1)^3$

b) $2iz^3$

c) $(1-2i)z^3$

d) $2z^3 - 3$

3. $\operatorname{Re} f(z) = ex(x \cdot \cos y - y \cdot \sin y)$, $f(0) = 0$ bo'lsin. U holda $f(z)$ golomorf funksiyani toping:

a) $ez \sin z$

b) zez

c) $z \cos z e z$

d) $z + ez$

4. $\operatorname{Re} f(z) = x \cdot \cos x \cdot \operatorname{ch} y + y \cdot \sin x \cdot \operatorname{sh} y$, $f(0) = 0$ bo'lsin. U holda $f(z)$ golomorf funksiyani toping:

a) $z \operatorname{sh} z$

b) Sinz

c) $z \operatorname{ch} z$

d) $z \cos z$

5. $\operatorname{Im} f(z) = y \cdot \cos y \cdot \operatorname{ch} x + x \cdot \sin y \cdot \operatorname{sh} x$, $f(0) = 0$ bo'lsin.

U holda $f(z)$ golomorf funksiyani toping:

a) $i \cdot z \cdot \cos z$,

b) $\operatorname{ch} z$

c) $\sin z \cdot \operatorname{ch} z$

d) $\cos z \cdot \operatorname{sh} z$

6. $z = (1 + i)^8 \cdot (1 - i\sqrt{3}) - 6$ uchun $|z|$ va $\arg z$ mos ravishda

a) $\frac{1}{4}, \pi$

b) $\frac{\sqrt{3}}{2}, 0$

c) $\frac{1}{4}, 0$

d) $\frac{1}{4}, \frac{\pi}{6}$

7. Parallelogrammning uchta uchlari berilgan: $z_1 = 1 + i$, $z_2 = 2 + 1,5 \cdot i$, $z_3 = 3 + 3 \cdot i$. z_2 uchiga qarama-qarshi yotuvchi to'rtinchi z_4 uchini toping.
- $z_4 = 2 + 2,5 \cdot i$
 - $z_4 = 1,5 + 2 \cdot i$
 - $z_4 = 1,5 + 2,5 \cdot i$
 - $z_4 = 2 + 2 \cdot i$
8. $\cos(2 + i)$ sonining haqiqiy qismini toping.
- $\sin 2 \cdot \sin 1$
 - $\cos 2 \cdot \sin 1$
 - $\operatorname{ch} 1 \cdot \cos 2$
 - $\operatorname{sh} 1 \cdot \cos 2$
9. $\operatorname{ctg}(\frac{\pi}{4} - i \cdot \ln 2)$ sonining mavhum qismini toping.
- 1
 - 0
 - 15/17
 - 12/15
10. $f(z) = z^2$ funksiya quyida keltirilgan sohalarning qaysi birida bir yaproqli.
- $0 < \operatorname{arg} z < \frac{\pi}{2}$
 - 0
 - $|z| < 1$
 - $-\frac{\pi}{2} \leq \operatorname{arg} z \leq \frac{\pi}{2}$
11. $M(z)$ nuqtaning S sferasidagi koordinatalari (ζ, η, ξ) bo'lsa $M(-z)$ ning koordinatlarini toping.
- $(-\zeta, -\eta, \xi)$
 - $(-\zeta, \eta, \xi)$
 - (ζ, η, ξ)
 - $(-\zeta, -\eta, -\xi)$
12. $\{\xi > 0\}$ Haqiqiy o'qdan yuqorida joylashgan tekislik tenglamasi.

- a) $Re z < 0$
- b) $Im z < 0$
- c) $Im z > 0$
- d) $Re z > 0$

13. $\ln x dx$ ni toping.

- a) $x \ln x + x + C$
- b) $x \ln x - x + C$
- c) $x \ln x + C$
- d) $0,5 \ln^2 x + C$

14. Sodda ratsional kasrni ko'rsating.

a) $\frac{3-x}{x^2+2x-3}$

b) $\frac{x-1}{x+1}$

c) $\frac{x+6}{(x+2)^2}$

d) $\frac{x-1}{x^2+x+1}$

15. $y = (x-3)(x^2+3x+9)$ funksiyaning $x=3$ nuqtadagi hosilasini toping.

- a) 0
- b) 27
- c) 3
- d) 9

16. $\frac{x dx}{x^4+1}$ integralni hisoblang.

- a) $\arctg \frac{x}{4} + C$
- b) $\arctg 4x + C$

- c) $\frac{1}{2} \arctg^2 x + C$
- d) $\frac{1}{2} \arctg x^2 + C$

17. Ushbu $y = x^3 + 3x^2 - 9x + 0$ Funksiyaning kamayish oralig'ini toping.

- a) $[3; -1]$
- b) $[-3; 1]$
- c) $[- ; -3]$
- d) $[1; +]$

18. Ushbu funksiyaning hosilasini toping: $f(x) = (2x - x^3)^{10}$

- a) $10(2x - x^3)(2 - 3x^2)$
- b) $9(2x - x^3)^9$
- c) $10(2x - x^3)^9(2 - 3x^2)$
- d) $10(2x - x^3)^9$

19. Quyidagi limitni hisoblang: $\lim_{x \rightarrow 0} \frac{\operatorname{tg} x - x}{x - \sin x}$

- a) 3
- b) 2
- c) 2
- d) 0,5

20. Agar $f(x) = \frac{1}{3}x^3 - 16x$ bo'lsa, $f'(4)$ ni toping.

- a) 0
- b) 3
- c) 4
- d) 5

21. $y\left(\frac{\pi}{10}\right)$ ni toping. $y = \sqrt[3]{\sin^2 5x}$

a) 0

b) 2

c) 3

d) 9

22. $y = \frac{x}{2} - \sqrt{x}$ funksiyaning $[0;16]$ kesmadagi eng katta qiymatini hisoblang.

a) 6

b) 5

c) 4

d) 2

23. Ushbu funksiyaning hosilasini toping: $f(x) = \sin(2/x)$

a) $(2/x^2) \cos(2/x)$

b) $-(2/x^2) \sin(2/x)$

c) $-(2/x) \cos(2/x^2)$

d) $-(2/x^2) \cos(2/x)$

24. $\frac{dx}{x(x^2 + 1)}$ ni toping.

a) $\ln|x| + \arctg x + C$

b) $\ln(x^2 + 1) + C$

c) $\ln \frac{|x|}{\sqrt{x^2 + 1}} + C$

d) $(\ln|x(x^2 + 1)|) + C$

25. $\frac{x^3 + 2x + 2\sqrt{x}}{x\sqrt{x}} dx$ ni hisoblang.

a) $\frac{4}{5}x^2\sqrt{x} + 4\sqrt{x} + \ln|x| + C$

b) $\frac{2}{5}x^2\sqrt{x} + 4\sqrt{x} + 2\ln|x| + C$

c) $\frac{2}{5}x^2\sqrt{x} + 4\sqrt{x} + \ln|x| + C$

d) $\frac{2}{5}x^2\sqrt{x} + 4\sqrt{x} + 2\ln|x|$

26. Funksiyaning hosilasini toping: $f(x) = 2^{\sqrt{x}}$

a) $\frac{2^{\sqrt{x}}}{2\sqrt{x}}$

b) $\sqrt{x} \cdot 2^{\sqrt{x}-1}$

c) $\frac{2^{\sqrt{x}} \ln 2}{2\sqrt{x}}$

d) $2^{\sqrt{x}} \ln 2$

27. $\vec{a}, \vec{b}, \vec{c}$ vektorlarning komplanarlik shartini ko'rsating.

a) $(\vec{a} + \vec{b}) \cdot \vec{c} = 0$

b) $(\vec{a} - \vec{b}) \cdot \vec{c} = 0$

c) $\vec{a} \cdot \vec{b} \cdot \vec{c} = 0$

d) $(\vec{a} \cdot \vec{b}) \cdot \vec{c} = 0$

28. $\vec{a} = 4\vec{i} + 7\vec{j} + 3\vec{k}$ va $\vec{b} = 3\vec{i} - 5\vec{j} + \vec{k}$ vektorlarning skalyar ko'paytmasi quyidagiga teng.

a) $\vec{a} \cdot \vec{b} = 20$

b) $\vec{a} \cdot \vec{b} = -50$

c) $\vec{a} \cdot \vec{b} = 30$

d) $\vec{a} \cdot \vec{b} = -20$

29. $\vec{a} = \vec{i}$ va $\vec{b} = \vec{i} + \vec{j}$ vektorlar orasidagi burchak quyidagiga teng.

a) $\varphi = 90^\circ$

b) $\varphi = 30^0$

c) $\varphi = 0^0$

d) $\varphi = 45^0$

30. $\vec{a} = \vec{j} + \vec{k}$ va $\vec{b} = \vec{k}$ vektorlarning vektor ko'paytmasi quyidagiga teng.

a) $[\vec{a}\vec{b}] = \vec{k}$

b) $[\vec{a}\vec{b}] = \vec{j}$

c) $[\vec{a}\vec{b}] = \vec{i}$

d) $[\vec{a}\vec{b}] = \vec{j} + \vec{k}$

31. $\vec{a} = \vec{i} + 2\vec{j} + 3\vec{k}$ va $\vec{b} = \vec{j} + 2\vec{k}$, $\vec{c} = \vec{k}$ vektorlarga yasalgan parallelopipedning hajmi quyidagiga teng.

a) $V = 1$

b) $V = 6$

c) $V = 12$

d) $V = 4$

32. $M(1,2)$ nuqtadan $2x - y - \sqrt{5} = 0$ to'g'ri chiziqgacha bo'lgan masofa quyidagilardan biriga teng.

a) $d = 0$

b) $d = \sqrt{5}$

c) $d = 1$

d) $d = \frac{1}{\sqrt{5}}$

33. $3x + 4y + 1 = 0$ va $4x - 3y - 5 = 0$ to'g'ri chiziqlar orasidagi burchak quyidagilardan biriga teng.

a) $\varphi = 90^0$

b) $\varphi = 60^0$

c) $\varphi = 30^0$

d) $\varphi = 0^0$

34. $y = 3x - 5$ to'g'ri chiziqning absissasi $x_0 = -4$ ga teng bo'lgan nuqtaning ordinatasi y_0 ni toping.

a) 17

b) -4

c) -17

d) 7

35. $C(3;2)$ nuqtaga koordinata boshiga nisbatan simmetrik bo'lgan nuqtani toping.

a) $(-3;-2)$

b) $(3;2)$

c) $(3;-2)$

d) $(2;3)$

36. $f(z) = \frac{1}{2}\left(z + \frac{1}{z}\right)$ funksiyabir yaproqli, bo'lgan sohani toping.

a) $Imz < 0$

b) $\{Imz > 0\}$

c) $Imz > 0$

d) $Rez < 0$

37. $f(z) = \frac{1}{z+2}$ funksiyabir yaproqli, bo'lmagan sohani toping.

a) $Rez > 3$

b) $|z| > 2$

c) $Imz > 0$

d) $|z| < 2$

38. $f(z) = e^z$ funksiya bir yaproqli, bo'lmagan sohani toping.

a) $Imz < 0$

b) $Imz > 0$

c) $0 < Rez < 1$

d) $|z| < 1$

39. $f(z) = \bar{z}^2$ funksiyaning haqiqiy va mavhum qismlarini toping.

a) $U(x, y) = x^2 - y^2 \quad v(x, y) = -2xy$

b) $U(x, y) = x^2 - y^2 \quad v(x, y) = 2xy$

c) $U(x, y) = x^2 - y^2 \quad v(x, y) = 2x$

d) $U(x, y) = x^2 \quad v(x, y) = 2xy$

40. $f(z) = |z|^2 [\operatorname{Re} z]^2$ funksiyaning haqiqiy qismini toping.

a) $U(x, y) = x^2 + 2xy^2$

b) $U(x, y) = y^2$

c) $U(x, y) = (x^2 + y^2) x^2$

d) $U(x, y) = x^2$

41. $f(z) = 2z + 1$ funksiyaning hosilasini toping.

a) $2y$

b) $2z \in \mathbb{C}$

c) $2x$

d) 1

42. $w = z^2$ funksiyaning $z_0 = 1$ nuqtadagi cho'zilish koeffitsientli $R(\varphi)$ va burilish burchagini $\alpha(\varphi)$ ni toping.

a) $R(\varphi) = 2 \quad \alpha(\varphi) = \frac{\pi}{2}$

b) $R(\varphi) = \frac{1}{2} \quad \alpha(\varphi) = 0$

c) $R(\varphi) = 2: \alpha(\varphi) = 0$

d) $R(\varphi) = 2 \quad \alpha(\varphi) = \pi$

43. $U = x^2 - y^2 + x$ garmonik funksiyaga s da qo'shma garmonik funksiyani toping?

a) $v(x, y) = 2xy + y + c$

b) $U(x, y) = 2xy - y + c$

c) $v(x, y) = y - 2xy + c$

d) $v(x, y) = y + 2xy + c$

44. $U(x, y) = xy + 1$ garmonik funksiyaga s da qo'shma garmonik funksiyani

toping?

- a) $v(x, y) = x^2 + y^2 + c$
- b) $U(x, y) = x^2 - y^2 + c$
- c) $v(x, y) = -\frac{1}{2}(x^2 - y^2) + c$
- d) $v(x, y) = \frac{1}{2}(x^2 - y^2) + c$

10. $v(x, y) = 3x^2y - y^3$ tenglik bilan berilgan $f(z) = U(x, y) + iv(x, y)$

golmorf funksiyani toping.

- a) $f(z) = z^3 + ci$
- b) $f(z) = z^2 + c$
- c) $f(z) = z^2$
- d) $f(z) = z^3 + c$

11. $\alpha = e^{2+i}$ moduli va argumentini topig.

- a) $|\alpha| = e^2 \quad \arg \alpha = 1$
- b) $|\alpha| = e^2 \quad \arg \alpha = -1$
- c) $|\alpha| = e \quad \arg \alpha = 1$
- d) $|\alpha| = e^{-2} \quad \arg \alpha = -1$

12. e^z ning $z = \frac{\pi}{2}i$ dagi qiymatini toping.

- a) -1
- b) 1
- c) i
- d) $-i$

13. $f(x) = \frac{1}{3}x^3 - \frac{3}{2}x^2 + 2x - 1$ funksiyaning maksimumini toping.

- a) $f_{\max}(0) = -1$
- b) $f_{\max}(1) = -\frac{1}{6}$
- c) $f_{\max}(2) = -\frac{1}{3}$
- d) maksimumi yo'q

14. $f(x) = \frac{1}{3}x^3 - \frac{3}{2}x^2 + 2x - 1$ funksiyaning minimumini toping.

a) $f_{\min}(1) = -\frac{1}{6}$

b) $f_{\min}(0) = -1$

c) $f_{\min}(2) = -\frac{1}{3}$

d) minimum yo'q

15. $\frac{dx}{2x+1}$ integralni hisoblang.

a) $\frac{1}{(2x+1)^2} + C$

b) $\sqrt{x} + C$

c) $\ln|x| + C$

d) $\frac{1}{2}\ln|2x+1| + C$

16. $(2x-1)^{10} dx$ integralni hisoblang.

a) $\frac{1}{11}(2x-1)^{11} + C$

b) $\frac{1}{22}(2x-1)^{11} + C$

c) $\frac{1}{22}(2x+1)^{11} + C$

d) $\frac{1}{11}(2x+1)^{11} + C$

17. $\operatorname{ctgx} dx$ integralni hisoblang.

a) $\operatorname{tg} x$

b) $\operatorname{ctg}^2 x + C$

c) $\ln|\sin x| + C$

d) $\ln|x| + C$

18. $\cos^2 x \, dx$ integralni hisoblang.

a) $x + \frac{1}{4} \sin 2x + C$

b) $\frac{1}{2}x + \sin 2x + C$

c) $\frac{1}{2}x + \frac{1}{4} \sin 2x + C$

d) $x + \sin 2x + C$

19. $\sin^2 x \, dx$ integralni hisoblang.

a) $x + \frac{1}{4} \cos 2x + C$

b) $x + \sin 2x + C$

c) $x + \cos 2x + C$

d) $\frac{1}{2}x - \frac{1}{4} \sin 2x + C$

20. $f(x) = x \sin x$ funksiyaning hosilasini toping.

a) $\sin x$

b) $\sin x + x \cos x$

c) $x \cos x$

d) $\cos x$

21. Ko'rsatilgan tartibdagi differensialni toping: $y = x^5$, $d^5 y = ?$

a) $d^5 y = 120 dx^5$

b) $d^5 y = 24 dx^5$

c) $d^5 y = 150 dx^5$

d) $d^5 y = 5 dx^5$

22. Funksiya grafigiga x_0 nuqtada o'tkazilgan urinma tenglamasi qaysi javobda to'g'ri berilgan.

a) $y = f(x_0) + f'(x_0)(x - x_0)$

- b) $y=f(x_0)-\frac{1}{f'(x_0)}(x-x_0)$
- c) $y=f(x_0)+f''(x_0)(x+x_0)$
- d) $y=f(x_0)+\frac{1}{f'(x_0)}(x-x_0)$

23. Funksiya grafigiga x_0 nuqtada o'tkazilgan normal tenglamasi qaysi javobda to'g'ri berilgan.

- a) $y=f(x_0)+f''(x_0)(x-x_0)$
- b) $y=f(x_0)-\frac{1}{f'(x_0)}(x-x_0)$
- c) $y=f(x_0)+f''(x_0)(x+x_0)$
- d) $y=f(x_0)+\frac{1}{f'(x_0)}(x-x_0)$

24. Funksiya hosilasini 0-ga aylantiradigan nuqta qanday nuqta deyiladi?

- a) minimum nuqta
- b) maksimum nuqta
- c) ekstremum nuqta
- d) statsionar nuqta

25. Agar $\vec{a} = \{1;3;-1\}$, $\vec{b} = \{2;1;4\}$ bo'lsa $\vec{c} = \vec{a} + \vec{b}$ ni toping.

- a) $\vec{c} = \{0;2;1\}$
- b) $\vec{c} = \{5;0;3\}$
- c) $\vec{c} = \{2;3;-1\}$
- d) $\vec{c} = \{3;4;3\}$

26. $A = (3;1;5)$, $B = (1;2;2)$ bo'lsa $\overrightarrow{AB}$ vektoring koordinatalarini toping.

- a) $\{0;1;4\}$
- b) $\{1;2;3\}$
- c) $\{-2;1;-3\}$
- d) $\{-1;2;3\}$

27. $\vec{a} = \{2;-1;3\}$, $\vec{b} = \{-6;3;-9\}$ vektorlar qanday o'zaro munosabatda bo'ladi?

a) $\vec{a}$ va $\vec{b}$ kollinear bo'ladi.

b) $\vec{a} \perp \vec{b}$

c) $\vec{a} = \vec{b}$

d) $\vec{a}$ va $\vec{b}$ kollinear emas.

28. $\vec{a} = \{-2; 0; 10\}$, $\vec{b} = \{0; -12; 0\}$, $\vec{c} = \{10; 0; 2\}$ vektorlar qanday o'zaro munosabatda bo'ladi?

a) $\vec{a}, \vec{b}, \vec{c}$ o'zaro ortogonal

b) $\vec{a}, \vec{b}, \vec{c}$ komplanar

c) $\vec{a}, \vec{b}, \vec{c}$ ortogonal

d) $\vec{a}, \vec{b}, \vec{c}$ kollinear

29. $\vec{a} = \{x_1; y_1; z_1\}$ va $\vec{b} = \{x_2; y_2; z_2\}$ vektorlarning skalyar ko'paytmasi qanday formula yordamida topiladi?

a) $\vec{a}\vec{b} = x_1^2 x_2^2 + y_1^2 y_2^2 + z_1^2 z_2^2$

b) $\vec{a}\vec{b} = (x_1 + y_1 + z_1) \cdot (x_2 + y_2 + z_2)$

c) $\vec{a} \vec{b} = \sqrt{x_1^2 + y_1^2 + z_1^2} \sqrt{x_2^2 + y_2^2 + z_2^2}$

d) $\vec{a}\vec{b} = x_1 x_2 + y_1 y_2 + z_1 z_2$

30. Agar $xy > 0$ bo'lsa $M(x, y)$ nuqta qaysi chorakda joylashgan?

a) II va III

b) I va III

c) III va IV

d) I va IV

31. Agar $xy < 0$ bo'lsa $M(x, y)$ nuqta qaysi chorakda joylashgan?

a) III va IV

b) I va III

c) I va IV

d) II va IV

32. Ordinata o'qida $A(1;-3;7)$ va $B(5;7;-5)$ nuqtalardan bir xil uzoqlikdagi nuqtani toping.

- a) $C(0;2;0)$
- b) $C(0;4;0)$
- c) $C(0;-2;0)$
- d) $C(0;-5;0)$

33. Parallelogramm uchta uchining koordinatalari $A(3;-5)$, $B(5;-3)$, $C(-1;3)$ berilgan, uning to'rtinchi uchi D nuqtaning koordinatalarini toping.

- a) $D(-4;1)$
- b) $D(0;-1)$
- c) $D(-3;1)$
- d) $D(-4;-1)$

34. $\vec{a}$ va $\vec{b}$ o'zaro perpendikulyar vektorlar bo'lib agar, $|\vec{a}| = 3$, $|\vec{b}| = 4$ bo'lsa, $|\vec{a} + \vec{b}|$ ni toping.

- a) $|\vec{a} + \vec{b}| = 1$
- b) $|\vec{a} + \vec{b}| = 5$
- c) $|\vec{a} + \vec{b}| = 0$
- d) $|\vec{a} + \vec{b}| = 2$

35. $|\vec{a}| = 3$, $|\vec{b}| = 2$, $(\vec{a}, \vec{b}) = 120^\circ$ bo'lsa $|\vec{a} + 2\vec{b}|$ ni toping.

- a) $\sqrt{13}$
- b) $\sqrt{15}$
- c) $\sqrt{37}$

1. e^z ning $z = \pi i$ dagi qiymatini toping.

- e) -1

f) 1

g) i

h) $-i$

2. $w = e^z$ akslantirsh yordamida $Re z = 1$ ning aksini toping.

e) $|w| = i$

f) $|w| = 1$

g) $|w| = e$

h) $w = e^2$

3. $w = e^z$ akslantirsh yordamida $Im z = \frac{\pi}{2}$ ning aksini toping.

e) $arg w = \frac{\pi}{2}$

f) $arg w = \pi$

g) $arg w = \frac{\pi}{2}$

h) $arg w = \frac{\pi}{2}$

4. Gyolder shartini aniqlang.

e) $|\varphi(z_1) - \varphi(z_2)| \leq A|z_1 - z_2|^\lambda, 0 < \lambda \leq 1$

f) $|\varphi(z_1) - \varphi(z_2)| \leq A|z_1 - z_2|^\lambda, 0 < \lambda \leq 1$

g) $|\varphi(z_1) - \varphi(z_2)| \leq A|z_1 - z_2|$

h) $|\varphi(z_1) - \varphi(z_2)| \leq |z_1 - z_2|^\lambda, 0 < \lambda \leq 1$

5. Saxodiskiy formulalari

e) $\phi^+(\xi_0) = \phi(\xi_0) + \varphi(\xi_0)$

f) $\phi^+(\xi_0) = \phi(\xi_0) - \frac{1}{2}\varphi(\xi_0)$

g) $\phi^+(\xi_0) = \phi(\xi_0) + \frac{1}{2}\varphi(\xi_0)$

h) $\phi(\xi_0) = \phi(\xi_0) + \frac{1}{2}\varphi(\xi_0)$

6. Koshi integral formulasi

$$e) \quad \phi(z) = \frac{1}{2\pi i} \int_c \frac{\varphi(\xi)}{\xi} d\xi$$

$$f) \quad \phi(z) = \frac{1}{2\pi i} \int_c \frac{1}{\xi - z} d\xi$$

$$g) \quad \phi(z) = \int_c \frac{\varphi(\xi)}{\xi - z} d\xi$$

$$h) \quad \phi(z) = \frac{1}{2\pi i} \int_c \frac{\varphi(\xi)}{\xi - z} d\xi$$

7. Koshi tipidagi integral

$$e) \quad \phi(z) = \int_c \frac{\varphi(\xi)}{\xi - z} d\xi$$

$$f) \quad \phi(z) = \frac{1}{2\pi i} \int_c \frac{1}{\xi - z} d\xi$$

$$g) \quad \phi(z) = \frac{1}{2\pi i} \int_c \frac{\varphi(\xi)}{\xi - z} d\xi$$

$$h) \quad \phi(z) = \frac{1}{2\pi i} \int_c \frac{\varphi(\xi)}{\xi} d\xi$$

8. $f: N \rightarrow C$ akslantirishning akslaridan iborat to'plam

e) C da akslantirish

f) C da qator

g) C da ketma-ketlik

h) C da funksiya

9. Ushbu $\sum_{n=0}^{\infty} (\frac{1}{2^n} - \frac{1}{3^n} i)$ qatorning 3-hadi nimaga teng

$$e) \quad \frac{1}{4} - \frac{1}{9} i$$

$$f) \quad \frac{1}{4} + \frac{1}{9} i$$

$$g) \quad -\frac{1}{4} - \frac{1}{9} i$$

$$h) \quad \frac{1}{4} i - \frac{1}{9}$$

10. Ushbu $\sum_{n=0}^{\infty} (\frac{1}{4^n} - \frac{1}{3^n} i)$ qatorning 3-hadi nimaga teng

e) $-\frac{1}{16} - \frac{1}{9} i$

f) $-\frac{1}{16} + \frac{1}{9} i$

g) $\frac{1}{16} - \frac{1}{9} i$

h) $\frac{1}{16} i - \frac{1}{9}$

11. Ushbu $\sum_{n=0}^{\infty} (\frac{1}{2^n} - \frac{1}{3^n} i)$ qatorning 1-hadi nimaga teng

e) $1 + i$

f) $1 - i$

g) $-1 - i$

h) $i - 1$

12. Ushbu $\sum_{n=0}^{\infty} (\frac{1}{2^n} - \frac{1}{4^n} i)$ qatorning 2-hadi nimaga teng

e) $-\frac{1}{4} - \frac{1}{16} i$

f) $\frac{1}{4} + \frac{1}{16} i$

g) $\frac{1}{4} - \frac{1}{16} i$

h) $-\frac{1}{4} + \frac{1}{16} i$

13. Teskari funksiyaning hosilasi qaysi javobda to'g'ri berilgan?

e) $[f^{-1}(y)]_{x_0} = -\frac{1}{f(x_0)}$

f) $[f^{-1}(y)]_{x_0} = \frac{1}{f(x_0)}$

g) $[f^{-1}(y)]_{x_0} = \frac{1}{f(x_0)}$

h) $[f^{-1}(y)]_{x_0} = -\frac{1}{f(x_0)}$

14. $\ln 1 + \frac{1}{n}$ qatorning xususiy yig'indisini toping.

e) $\ln n - 1$

f) $\ln(n+1) - \ln 2$

g) $\ln(n+1)$

h) $-\ln(n+1)$

15. Davri 2π ga teng bo'lgan $f(x) = \begin{cases} 1, & 0 < x < \pi \\ 0, & -\pi < x < 0 \end{cases}$ funksiya uchun a_0 Furye

koeffitsientini toping.

e) 0,5

f) 1

g) -0,5

h) 2

16. Trigonometrik qatorni ko'rsating.

e) $\sum_{n=0}^{\infty} \frac{2 \cos x}{3^n}$

f) $\sum_{n=0}^{\infty} \frac{2x \cos x}{3^n}$

g) $\sum_{n=0}^{\infty} \frac{2 \cos nx}{3^n}$

h) $\sum_{n=0}^{\infty} \frac{\cos nx^2}{3^n}$

17. $y = x^2/2$, $y = 1/(1+x^2)$ egri chiziqlar bilan chegaralangan figura yuzini hisoblang.

e) $\pi/2$

f) $1/3 - \pi/2$

g) $\pi - 2$

h) $\pi/2 - 1/3$

18. $y=x$, $y=0$, $x=1$, $x=3$ chiziqlar bilan chegaralangan figurani Ox o'qi atrofida aylantirishdan hosil bo'lgan jism hajmini hisoblang.

e) $32\pi/3$

f) $21,6\pi$

g) $26\pi/3$

h) 16π

19. Agar $a = \int_0^1 e^x dx$, $b = \int_0^1 e^{\sin x} dx$, $c = \int_0^1 e^{\sqrt{x}} dx$ bo'lsa, quyidagilardan qaysi biri

o'rinli?

e) $b < a < c$

f) $a < b < c$

g) $c < b < a$

h) $a < c < b$

20. Quyidagi qatorlardan qaysi biri uzoqlashuvchi?

e) $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n} + 5^n}$

f) $\sum_{n=1}^{\infty} \frac{1}{n^2}$

g) $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n}}$

h) $\sum_{n=1}^{\infty} \frac{1}{5^n}$

21. Quyidagi qatorlardan qaysi biri yaqinlashuvchi?

e) $\sum_{n=1}^{\infty} \frac{n}{n+1}$

f) $\sum_{n=1}^{\infty} \frac{1}{n+2}$

g) $\sum_{n=1}^{\infty} \frac{2^n}{1+7^n}$

h) $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n}+5}$

22. $z = \sqrt{4 - x^2 - 2y^2}$ funksiyaning aniqlanish sohasini toping.

e) yarim o'qlari $a=2$ va $b=\sqrt{2}$ bo'lgan ellips

f) tekislik

g) yarim o'qlari $a=2$ va $b=\sqrt{2}$ bo'lgan ellips va u bilan chegaralangan soha

h) yarim o'qlari $a=4$ va $b=2$ bo'lgan ellips va u bilan chegaralangan soha

23. Quyidagi mulohazalardan qaysi biri to'g'ri?

e) Integrallanuvchi funksiya har doim uzluksiz bo'ladi.

f) Darbuning yuqori yig'indisi har qanday integral yig'indidan kichik bo'ladi.

g) Darbuning quyi yig'indisi har qanday integral yig'indidan katta bo'ladi.

h) Darbuning quyi yig'indisi yuqori yig'indidan katta emas.

24. Quyidagi jummalardan qaysi biri to'g'ri?

e) Agar $\int_a^b f(x)dx = 0$ bo'lsa, u holda $[a;b]$ kesmada $f(x)=0$ bo'ladi.

f) Agar $[a;b]$ kesmada $f(x) \geq 0$ bo'lsa, u holda $\int_a^b f(x)dx \geq 0$ bo'ladi.

g) Agar $\int_a^b f(x)dx > 0$ bo'lsa, u holda $[a;b]$ kesmada $f(x) \geq 0$ bo'ladi.

h) Agar $\int_a^b f(x)dx \leq 0$ bo'lsa, u holda $[a;b]$ kesmada $f(x) \leq 0$ bo'ladi.

25. Quyidagi munosabatlardan qaysi biri o'rinli?

$$\text{e)} \quad \left| \int_a^b f(x) dx \right| = \int_a^b |f(x)| dx$$

$$\text{f)} \quad \left| \int_a^b f(x) dx \right| \leq \int_a^b |f(x)| dx$$

$$\text{g)} \quad \left| \int_a^b f(x) dx \right| \leq \int_a^b f(|x|) dx$$

$$\text{h)} \quad \left| \int_a^b f(x) dx \right| \leq \int_a^b |f(x)| dx$$

26. $\int_a^x \frac{1}{1+t^2} dt$ integralning hosilasi quyidagi funksiyalardan qaysi biriga teng

bo'ladi?

$$\text{e)} \quad \frac{1}{1+x^2}$$

$$\text{f)} \quad \frac{1}{x^2}$$

$$\text{g)} \quad \arctg x$$

$$\text{h)} \quad -\frac{1}{1+x^2}$$

27. $\vec{a} = \{2; 1; 0\}$ va $\vec{b} = \{0; -2; 1\}$ vektorlarga yasalgan parallelogrammning diagonallari orasidagi burchakni toping.

$$\text{e)} \quad 45^\circ$$

$$\text{f)} \quad 0^\circ$$

$$\text{g)} \quad 60^\circ$$

$$\text{h)} \quad 90^\circ$$

28. $\vec{a} = \{3; 0; -4\}$ va $\vec{b} = \{1; -2; 2\}$ vektorlar orasidagi burchak sinusini toping.

$$\text{e)} \quad \frac{2\sqrt{2}}{3}$$

f) $\frac{2\sqrt{3}}{3}$

g) $\frac{2}{3}$

h) $\frac{3}{4}$

29. $\vec{a}\vec{b} = 42$ bo'lgan holda, $\vec{a} = \{4; 2; -1\}$, vektorga kollinear $\vec{b}$ vektorni toping.

e) $\vec{b} = \{-4; -2; 1\}$

f) $\vec{b} = \{2; 1; -1\}$

g) $\vec{b} = \{8; 4; -2\}$

h) $\vec{b} = \{2; 4; -1\}$

30 $\vec{a} = \{-2; -1; 1\}$, $\vec{b} = \{4; -4; 1\}$, $\vec{c} = \{4; -6; 2\}$ vektorlarning aralash

ko'paytmasini toping

e) 0

f) 6

g) 12

h) 4

31. $\vec{a} = \{-1; 3; 4\}$, $\vec{b} = \{2; 5; 2\}$, $\vec{c} = \{1; 2; 3\}$ vektorlarga yasalgan

parallelipepedning hajmini toping.

e) 54

f) 13,5

g) -27

h) 27

32. Parallelogramm uchta uchining koordinatalari berilgan; $A(-2; 3)$,

$B(4; -5)$, $C = (-3; 1)$ parallelogrammning yuzi nimaga teng.

e) 20

f) 22

g) 16

h) 49

33. $\vec{a} = \{2; -3; -1\}$ vektor oxirining koordinatalari $(1; -1; 2)$ nuqtada bo'lsa, boshining koordinatalarini toping.

e) $(-1; 2; 3)$

f) $(-1; 3; 2)$

g) $(0; -1; 2)$

h) $(3; 2; -1)$

34. $M(0; -4)$ nuqtaning qutb koordinatasini toping.

e) $4; \frac{\pi}{2}$

f) $4; \frac{\pi}{4}$

g) $4; \frac{3\pi}{2}$

h) $(4; 45^0)$

35. $A(-2; 2)$, $M(1; -1)$ nuqtalar berilgan. Koordinata boshidan va AB kesmanin o'rtasidan o'tuvchi to'g'ri chiziq tenglamasini tuzing.

e) $x + 2y = 0$

f) $x - 2y = 0$

g) $x + y = 0$

1. Ushbu $\sum_{n=0}^{\infty} (1 - \frac{1}{3^n})i$ qatorning 3-hadi nimaga teng

a) $-1 - \frac{1}{9}i$

b) $1 + \frac{1}{9}i$

c) $1 - \frac{1}{9}i$

d) $-1 + \frac{1}{9}i$

2. Ushbu $\sum_{n=0}^{\infty} (1 - 2^n i)$ qatorning 3-hadi nimaga teng

a) $-1 - \frac{1}{9}i$

b) $1 - 8i$

c) $1 - 4i$

d) $1 + 8i$

3. Ushbu $\sum_{n=0}^{\infty} (2^n - 3^n i)$ qatorning 3-hadi nimaga teng

a) $8 - 27i$

b) $1 + 8i$

c) $4 + 9i$

d) $4 - 9i$

4. Ushbu $\sum_{n=1}^{\infty} (\frac{1}{2^n} - \frac{1}{3^n} i)$ qatorning 3-hadi nimaga teng

a) $\frac{1}{8} - \frac{1}{27}i$

b) $-\frac{1}{8} - \frac{1}{27}i$

c) $\frac{1}{8} + \frac{1}{27}i$

d) $-\frac{1}{8} + \frac{1}{27}i$

5. Markazi $z = 1$ nuqtada va radiusi 1 ga teng bo'lgan yopiq doiraning tashqarisi.

a) $|z - 1| > 1$

b) $|z - 1| < 1$

c) $|z| > 1$

d) $|z| < 1$

6. Haqiqiy o'qdan yuqorida joylashgan tekislik tenglamasi.

- a) $\{Rez \geq 2\}$
- b) $\{Rez \leq 2\}$
- c) $Rez > 0$
- d) $\{Imz \leq 2\}$

7. Haqiqiy o'qdan yuqorida va undan 2 birlik masofa uzoqlikda joylashgan yarim tekislik.

- a) $\{Imz \leq 2\}$
- b) $\{Rez \leq 2\}$
- c) $\{Rez \geq 2\}$
- d) $\{Imz \geq 2\}$

8. Ihtiyoriy nuqtasidan mavhum o'qqacha bo'lgan masofa 1 dan kichik bo'lgan yo'lak ?

- a) $Imz < 1$
- b) $0 < Rez < 1$
- c) $|Rez| < 1$
- d) $0 < Imz < 1$

9. Mavhum o'qning o'ng tomonini ifodalovchi tekislik tenglamasi

- a) $\{Rez < 0\}$
- b) $\{0 < Imz\}$
- c) $\{Imz < 0\}$
- d) $\{Rez = 0\}$

10. Agar $W = \varphi(z)$ funksiya z_0 nuqtada hosilaga ega bo'lsa, uni bu nuqtada.

- a) Differensiallanuvchi
- b) Monogen bo'lmagan funksiya deyiladi
- c) Analitik funksiya deyiladi
- d) Monogen funksiya deyiladi

11. Yopiq G sohada uzluksiz bo'lgan $W = \varphi(z)$ funksiya shu sohada Tekis uzluksiz.

- a) Tekis uzluksiz.
- b) Chegaralangan
- c) Eng katta va eng kichik modulli qiymatlarga ega
- d) Hamma javob to'g'ri

12. Agar har qanday kichik $\varepsilon > 0$ uchun shunday kichik $\delta > 0$ ni ko'rsatish mumkin bo'lsaki,

$|\Delta z| < \delta$ bo'lganda $|\Delta W| < \varepsilon$ bo'lsa $f(z)$ funksiya z_0 nuqtada

- a) chegaralanmagan
- b) Chegaralangan
- c) Uzluksiz
- d) Uzulishga ega deyiladi.

13. Agar $|z - z_0| < \delta$ tevarak ichidagi z nuqtalarga mos bo'lgan $W = \varphi(z)$ nuqtalar $|f(z) - f(z_0)| < \varepsilon$ ichiga joylashsa $W = \varphi(z)$ funksiyaz₀ nuqtada

- a) Uzulishga ega
- b) Limitga ega deyiladi
- c) z_0 nuqtada uzluksiz deyiladi
- d) Limitga ega emas

14. Quyidagi jummalardan qaysi biri noto'g'ri?

- a) Agar qatorning biror qoldig'i yaqinlashuvchi bo'lsa, u holda uning o'zi ham yaqinlashuvchi bo'ladi.
- b) Agar qator yaqinlashuvchi bo'lsa, u holda uning xususiy yig'indilaridan iborat ketma-ketlik chegaralangan bo'ladi.
- c) Agar qator yaqinlashuvchi bo'lsa, u holda uning har qanday qoldig'i ham yaqinlashuvchi bo'ladi.
- d) Agar qatorning umumiy hadi nolga intilsa, u holda qator yaqinlashuvchi bo'ladi.

15. Quyidagi jummalardan qaysi biri noto'g'ri?

- a) Yaqinlashuvchi va uzoqlashuvchi qatorlarning yig'indisi uzoqlashuvchi qator bo'ladi.
- b) Yaqinlashuvchi qatorning songa ko'paytmasi yaqinlashuvchi qator bo'ladi.

- c) Ikkita uzoqlashuvchi qatorning ayirmasi uzoqlashuvchi qator bo'ladi.
- d) Chekli sondagi yaqinlashuvchi qatorlarning yig'indisi yaqinlashuvchi qator bo'ladi.

16. Uzoqlashuvchi qatorni ko'rsating.

a) $\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2 + 1}$

b) $\sum_{n=1}^{\infty} (-1)^n \frac{n}{n+1}$

c) $\sum_{n=1}^{\infty} \frac{\cos n}{n^2}$

d) $\sum_{n=1}^{\infty} \frac{(-1)^n}{5^n}$

17. $\sum_{n=1}^{\infty} (-1)^n \frac{2^n}{5^n}$ qator yig'indisini toping.

a) $-\frac{5}{3}$

b) $\frac{2}{3}$

c) $-\frac{2}{7}$

d) $\frac{5}{3}$

18. Shartli yaqinlashuvchi qatorni ko'rsating.

a) $\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2 + 1}$

b) $\sum_{n=1}^{\infty} \frac{\cos n}{n^2}$

c) $\sum_{n=1}^{\infty} (-1)^n \frac{1}{\sqrt{n} + 1}$

$$d) \sum_{n=1}^{\infty} \frac{(-1)^n}{5^n}$$

19. Umumiy hadi $u_n(x) = x^n$ bo'lgan funksional qatorning aniqlanish va yaqinlashish sohalarini ko'rsating.

$$a) (0; \infty); (0;1)$$

$$b) (-\infty; \infty); (-1;1]$$

$$c) [0; \infty); [-1;1]$$

$$d) (-\infty; \infty); (-1;1)$$

20. Yaqinlashish sohasi uchun noto'g'ri formulani ko'rsating.

$$a) e^{x-1} = \sum_{n=0}^{\infty} \frac{(x-1)^n}{n!}$$

$$b) \ln(1-x) = \sum_{n=1}^{\infty} (-1)^n \frac{x^n}{n}$$

$$c) \frac{1}{1-x} = \sum_{n=0}^{\infty} x^n$$

$$d) e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$$

22. Yaqinlashish sohasi uchun noto'g'ri formulani ko'rsating.

$$a) e^{x-1} = \sum_{n=0}^{\infty} \frac{(x-1)^n}{n!}$$

$$b) e^x = \sum_{n=1}^{\infty} \frac{x^n}{n!}$$

$$c) \frac{1}{1-x} = \sum_{n=0}^{\infty} x^n$$

$$d) \ln(1+x) = \sum_{n=1}^{\infty} (-1)^n \frac{x^n}{n}$$

23. $\lim_{\substack{x \rightarrow 0 \\ y \rightarrow 0}} \frac{3 - \sqrt{xy + 9}}{xy}$ ni toping.

a) 6

b) 3

c) $-\frac{1}{6}$

d) $\frac{1}{3}$

24. $\lim_{\substack{x \rightarrow 0 \\ y \rightarrow 0}} \frac{\sin(xy)}{y}$ ni toping.

a) 0

b) xy

c) y

d) 1

25. $z = \sqrt{4 - x^2 - y^2}$ funksiyaning aniqlanish sohasini toping.

a) $x^2 + y^2 \leq 4$

b) $x^2 + y^2 < 4$

c) $x^2 + y^2 = 4$

d)

26. $z = \frac{1}{\sqrt{x^2 + y^2 - 16}}$ funksiyaning aniqlanish sohasini toping.

a) $x^2 + y^2 \leq 6$

b) $x^2 + y^2 > 16$

c)

d) $x^2 + y^2 \leq 0$

27. $12x - 5y - 26 = 0$ va $12x - 5y - 39 = 0$ parallel to'g'ri chiziqlar orasidagi masofani toping.

a) $d = 13$

b) $d = 2$

c) $d = 5$

d) $d = 1$

28. Qanday shart berilganda $ax + by + c = 0$ to'g'ri chiziq Oy o'qining musbat yarim o'qini kesib o'tadi?

a) $ab < 0$

b) $bc < 0$

c) $bc > 0$

d) $ac < 0$

29. β ning qanday kiymatida $\beta x + 3y + 5 = 0$ va $3x - 5y + 6 = 0$ to'g'ri chiziqlar o'zaro perpendikulyar bo'ladi?

a) $\beta = 5$

b) $\beta = 1$

c) $\beta = 3$

d) $\beta = 4$

30. $M(3; -4)$ nuqtaga $x + y = 0$ to'g'ri chiziqqa nisbatan simmetrik bo'lgan nuqtaning koordinatalari topilsin.

a) $(-3; -4)$

b) $(4; 3)$

c) $(-4; 3)$

d) $(4; -3)$

31. Koordinata boshidan $7x - 8y + 15 = 0$ to'g'ri chiziqqa tushirilgan perpendikulyar tenglamasini tuzing.

a) $8x = 15$

b) $7x + 8y = 0$

c) $y = 15$

d) $8x + 7y = 0$

32. $12x - 5y + 52 = 0$ to'g'ri chiziq tenglamasini normal ko'rinishga keltiring.

- a) $\frac{12}{13}x - \frac{5}{13}y + 4 = 0$
- b) $\frac{12}{13}x - \frac{5}{13}y - 52 = 0$
- c) $5y - 12x - 4 = 0$
- d) $\frac{5}{13}y - \frac{12}{13}x - 4 = 0$

33. Giperbolaning fokuslari orasidagi masofa 8 ga, direktrisalari orasidagi masofa 6 ga teng bo'lsa, uning yarim o'qlarini aniqlang.

- a) $a = 2\sqrt{3}$, $b = 2$
- b) $a = 2$, $b = 2$
- c) $a = 2\sqrt{3}$, $b = \sqrt{3}$
- d) $a = \sqrt{3}$, $b = 2$

34. Ekstsentrismet $e = 2$ bo'lgan giperbolaning asimptotalari orasidagi burchakni toping.

- a) $\alpha = 45^\circ$
- b) $\alpha = 90^\circ$
- c) $\alpha = 120^\circ$
- d) $\alpha = 30^\circ$

35. Fokuslari orasidagi kesma kichik o'qlari uchlaridan $\alpha = 60^\circ$ burchak ostida ko'rinadigan ellipsning ekstsentrismetini toping.

- a) $e = 1.5$
- b) $e = 0.5$
- c) $e = -0.5$

1. $W = \sqrt[4]{z}$ funksiya necha qiymatli.

- a) To'rt qiymatli
- b) Bir qiymatli
- c) Uch qiymatli
- d) Ikki qiymatli

2. $|z| - z = 1 + 2i$ tenglamani eching.

a) $\frac{3}{2} + 2i$

b) $3 - 2i$

c) $\frac{1}{2} - 2i$

d) $z = \frac{3}{2} - 2i$

3. $z^2 = 3 - 4i$ tenglamani yeching.

a) $z_1 = 2 - i, z_2 = -2 + i$

b) $z_{1,2} = \pm(2 + i)$

c) $\emptyset$

d) $z_{1,2} = (2 - i)$

4. $\sqrt{3 + 4i}$ ning barcha qiymatlarini toping.

a) $\emptyset$

b) $\pm(2 - i)$

c) $\pm(i - 2)$

d) $\pm(2 + i)$

5. $\sqrt[4]{-1}$ ning barcha qiymatlarini toping.

a) $\emptyset$

b) $\pm \frac{\sqrt{2}}{2}(1 \pm i)$

c) $\pm \frac{\sqrt{2}}{2}(1 - i)$

d) $\pm \frac{\sqrt{2}}{2}(1 + i)$

6. $W(0) = 0, W(1 + i) = 2 + 2i, W(2i) = 4$ shartlarni qanoatlantiruvchi $W(z)$

akslantirishni toping.

a) $W = \frac{2z}{z - i}$

b) $W = \frac{2z}{z + i}$

c) $W = \frac{2z-i}{z}$

d) $W = \frac{2z+i}{z-i}$

7. $W(0)=4$ $W(1+i)=2+2i$ $W(2i)=0$ shartlarni qanoatlantiruvchi $W(z)$

akslantirishni toping.

a) $W = 2iz + 2$

b) $W = 2iz - 4$

c) $W = 2iz + 4$

d) $W = 2iz - 2$

8. $W = z^2$ akslantirish yordamida tekislikning qaysi qismi cho'ziladi.

a) $|z| > \frac{1}{2}$

b) $|z| < \frac{1}{2}$

c) $|z| = \frac{1}{2}$

d) $\{ |z| = 1 \}$

9. $W = z^2$ akslantirishning $z_0 = -\frac{1}{4}$ nuqtadagi cho'zilish koeffitsientini toping.

a) $R(\varphi) = \frac{1}{4}$

b) $R(\varphi) = 1$

c) $R(\varphi) = -\frac{1}{2}$

d) $R(\varphi) = \frac{1}{2}$

10. $W = z^{-2}$ akslantirishning $z_0 = i$ nuqtadagi burilish burchagi $\alpha(\varphi)$ ni toping.

a) $\alpha(\varphi) = \pi$

b) $\alpha(\varphi) = \frac{\pi}{2}$

c) $\alpha(\varphi) = \varphi - \frac{\pi}{2}$

d) $\alpha(\varphi) = \varphi - \pi$

11. $W = z^{-2}$ akslantirishning $z_0 = i$ nuqtadagi cho'zilish koeffitsentini toping.

a) $R(\varphi) = \frac{\pi}{2}$

b) $R(\varphi) = \varphi - \frac{\pi}{2}$

c) $R(\varphi) = 1$

d) $R(\varphi) = 2$

12. Riman sferasidagi shimoliyqutbidagi P nuqta C_z tekislikda qaysi nuqtaga akslanadi.

a) $z=z_0$

b) $z=0$ nuqtaga

c) $z=\infty$ nuqtaga

d) $z=-\infty$ nuqtaga.

13. $z = \sqrt{x^2 - y^2}$ bo'lsa, dz ni toping.

a) $\frac{ydy}{\sqrt{x^2 - y^2}}$

b) $\frac{xdx - ydy}{\sqrt{x^2 - y^2}}$

c) $\frac{xdx}{\sqrt{x^2 - y^2}}$

d) $\frac{dx - dy}{\sqrt{x^2 - y^2}}$.

14. $z=\cos(xy)$ funksiyaning to'la differensiali dz ni toping.

a) $\cos(xy) (ydx+xdy)$

b) $\sin(xy) (xdx+ydy)$

c) $-\sin(xy) (ydx+xdy)$

d) $\cos ydx+\sin xdy$

15. $z = ye^{-xy}$ bo'lsa, $\frac{\partial z}{\partial x}$ ni toping.

a) $-y^2 e^{-xy}$

b) $3y^2 e^{-xy}$

c) e^{xy}

d) $2ye^{-xy}$

16. $z = y \ln x$ bo'lsa, $\frac{\partial^2 z}{\partial x^2}$ ni toping.

a) $\frac{y}{x}$

b) $-\frac{y}{x^2}$

c) $\frac{1}{x}$

d) y

17. $z = y \ln(x + y)$ bo'lsa, $\frac{\partial^2 z}{\partial x \partial y}$ ni toping.

a) $\frac{y}{(x + y)^2}$

b) $-\frac{1}{(x + y)^2}$

c) $\frac{1}{x + y}$

d) $\frac{x}{(x + y)^2}$

18. $z = x^2 + y^2 - 8x - 2$ funksiyaning minimumini toping.

a) 0

b) -10

c) -18

d) 2

19. $z = -x^2 - y^2 + 4x + 6y$ funksiyaning maksimumini toping.

a) 13

b) 9

c) 8

d) 10

20. $\sum_{n=0}^{\infty} \frac{x^n}{2^n n}$ darajali qatorning yaqinlashish radiusi va sohasini toping.

a) $r=2; (-2;2)$

b) $r=1/2; (-1/2;1/2)$

c) $r=2; [-2;2)$

d) $r=1/2; [-1/2;1/2)$

21. Jism $v(t)=3t^2 + 1$ (m/s) tezlik bilan to'g'ri chiziqli harakat qilmoqda.

Jismning $t_1 = 0$ (s) dan $t_2 = 4$ (s) gacha bo'lgan vaqt oralig'ida bosib o'tgan yo'lini hisoblang. (m)

a) 49

b) 68

c) 65

d) 22

22. $\int_1^+ \frac{dx}{x^4}$ ni hisoblang.

a) 0,5

b) 0,25

c) 1/3

d) uzoqlashuvchi

23. $\frac{x^2}{4} + \frac{y^2}{9} = 1$ ellips bilan chegaralangan figura yuzini toping.

- a) 4π
- b) 9π
- c) 6π
- d) π

24. $y = x^2 - 6x + 8$ parabola va Ox o'qi bilan chegaralangan figura yuzini toping.

- a) $\frac{2}{3}$
- b) $\frac{4}{3}$
- c) 4
- d) 2

25. Qaysi javobda Nyuton-Leybnis formulasi berilgan.

- a) $\int_a^b f(x)dx = \Phi(x) \Big|_a^b = \Phi(b) - \Phi(a)$
- b) $\Phi(b) = \int_a^b f(x)dx + C$
- c) $\int_a^b f(x)dx = \Phi(x) \Big|_a^b = \Phi(b) + \Phi(a)$
- d) $\int_a^b f(x)dx = \Phi(x) \Big|_a^b = \Phi(a) - \Phi(b)$

26. Quyidagi e^x , e^{-x} , $2e^x$ funksiyalardan qaysilari $y'' - y = 0$ tenglama uchun yechimlarning fundamental sistemasini tashkil etadi?

- a) e^x , $2e^x$
- b) $e^x, e^{-x}, 2e^x$
- c) $e^{-x}, 2e^x$
- d) e^x, e^{-x} va $e^{-x}, 2e^x$

27. Ikkinchi tartibli chiziq markazini toping $5x^2 + 8xy + 5y^2 - 18x - 18y + 11 = 0$.

- a) $O'(-1, -1)$

- b) $O'(1,1)$
- c) $O'(2,2)$
- d) $O'(1,-1)$

28. Ikkinchi tartibli chiziq tipini aniqlang $5x^2 + 8xy + 5y^2 - 18x - 18y + 11 = 0$.

- a) Parabola
- b) Ikkita kesishuvchi to'g'ri chiziq
- c) Giperbola
- d) Ellips

29. Markaziy ikkinchi tartibli chiziqning qanday yo'nalishlari bosh yo'nalishlar deyiladi?

- a) o'zaro qo'shma va ortogonal
- b) o'zaro qo'shma
- c) o'zaro kollinear
- d) ixtiyoriy

30. $Ax + By + Cz + D = 0$ tekislik va $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziq

orasidagi burchak qanday formula yordamida hisoblanadi?

- a) $\cos \phi = \frac{Al + Bm + Cn}{\sqrt{A^2 + B^2 + C^2} \sqrt{l^2 + m^2 + n^2}}$
- b) $\sin \phi = \frac{Al + Bm + Cn}{\sqrt{A^2 + B^2 + C^2} + \sqrt{l^2 + m^2 + n^2}}$
- c) $\cos \phi = \frac{Al + Bm + Cn}{\sqrt{A^2 + B^2 + C^2} + \sqrt{l^2 + m^2 + n^2}}$
- d) $\sin \phi = \frac{Al + Bm + Cn}{\sqrt{A^2 + B^2 + C^2} \sqrt{l^2 + m^2 + n^2}}$

31. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziq va $Ax + By + Cz + D = 0$ tekislik umumiy

nuqtaga ega bo'lmaslik (parallellik) shartini ko'rsating.

- a) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$
- b) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$
- c) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

d) $\frac{A}{l} = \frac{B}{m} = \frac{C}{n}$

32. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziqning $Ax + By + Cz + D = 0$ tekislikka

perpendikulyarlik shartini ko'rsating.

a) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

b) $\frac{A}{l} = \frac{B}{m} = \frac{C}{n}$

c) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

d) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

33. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziqning $Ax + By + Cz + D = 0$ tekislikda

yotish shartini ko'rsating.

a) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

b) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

c) $\frac{A}{l} = \frac{B}{m} = \frac{C}{n}$

d) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

34. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziqning $Ax + By + Cz + D = 0$ tekislik

bilan bir nuqtada kesishish shartini ko'rsating.

a) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

b) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

c) $Al + Bm + Cn = 0$

d) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

35. $A_1x + B_1y + C_1z + D = 0, A_2x + B_2y + C_2z + D_2 = 0$ va $A_3x + B_3y + C_3z + D_3 = 0$ tenglamalar

bilan berilgan tekisliklarning bir nuqtada kesishish shartini ko'rsating.

$$a) \begin{vmatrix} A_1 & B_1 & C_1 \\ A_2 & B_2 & C_2 \\ A_3 & B_3 & C_3 \end{vmatrix} = 0$$

$$b) \frac{A_1}{A_2} = \frac{B_1}{B_2} = \frac{C_1}{C_2}$$

$$c) \frac{A_1}{A_3} = \frac{B_1}{B_3} = \frac{C_1}{C_3}$$

1. $z = c_1 e^{imt} + c_2 e^{-imt}$ tenglama qanday egri chiziqni ifodalaydi.

- a) Tekislik tenglamasi
- b) Aylananing parametric tenglamasi
- c) Ellipsning parametric tenglamasi
- d) Ixtiyoriy bir egrichiziq tenglamasi

2. $z = -1 + i\sqrt{3}$ sonni trigonometrik shaklda tasvirlang.

$$a) z = -1 + i\sqrt{3} = 2\left(\cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3}\right)$$

$$b) z = -2 \cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3}$$

$$c) z = \cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3}$$

$$d) z = 2 \sin\frac{2\pi}{3} + i\cos\frac{2\pi}{3}$$

3. $z = Re^{i\varphi}$ tenglama kompleks sonlar tekisligida .

- a) Ixtiyoriy aylana
- b) Markazii xiyoriy nuqtadaradiusi R ga teng bo'lgan aylana.
- c) Markazi koordinatalar boshida radiusi R ga teng bo'lgan aylana
- d) Burchaklar kattaligi φ bo'lgan yoy.

4. α kompleks songa qo'shma kompleks son tekislikda qayerda joylashgan bo'ladi.

- a) OY o'qga nisbatan
- b) To'g'ri javob keltirilmagan

- c) Koordinata boshiga nisbatan simmetrik
- d) OX o'qiga nisbatan simmetrik
5. $z = 1 - it$ ($0 \leq t \leq 2$) funksiya aniqlagan egri chiziqni toping.
- a) $\{x = -1, -2 \leq y \leq 0\}$
- b) $\{x = 1, 0 \leq y \leq 2\}$
- c) $\{x = 1 : -2 \leq y \leq 0\}$
- d) $\{x = -1, 0 \leq y \leq 2\}$
6. $1 < |z - 1| < 3$ nuqtalarning geometrik o'rnini toping.
- a) Markazi $z = 1$ nuqtada radiusi 2 bo'lgan doira.
- b) Markazi $z = 3$ nuqtada radiusi 2 bo'lgan doira.
- c) Markazi $z = 1$ nuqtada radiusi 3 bo'lgan ochiq doira.
- d) Markazlari $z = 1$ nuqtada radiuslari 1 va 3 bo'lgan halqa
7. $\operatorname{Im} z = 0$ nuqtalarning geometrik o'rnini toping.
- a) $\{x \in \mathbb{R}\}$ – yarim tekislik.
- b) $\{y \in \mathbb{R}\}$ yarim tekislik.
- c) $\{y \in \mathbb{R}\}$ yarim tekislik.
- d) $\{x \in \mathbb{R}\}$ yarim tekislik.
8. $\lim_{n \rightarrow \infty} \frac{a^n}{1 + a^{2n}} + 1$ ni hisoblang.
- a) 0
- b) 1
- c) 2
- d) 5
9. Kompleks tekislikning birinchi kvadratini tengsizlik yordamida yozing.
- a) $\{\operatorname{Re} z > 0, \operatorname{Im} z > 0\}$
- b) $\{\operatorname{Re} z \geq 0 : \operatorname{Im} z < 0\}$
- c) $\{\operatorname{Re} z < 0, \operatorname{Im} z > 0\}$
- d) $\{\operatorname{Re} z < 0 : \operatorname{Im} z < 0\}$

10. $z = R e^{it} \quad 0 \leq t \leq \frac{\pi}{2} \quad R > 0$ funksiya aniqlagan egrichiziqni toping.

$$\{z \mid |z| = R\},$$

a) $\operatorname{Re} z = 0$, aylanayoyi

$$\operatorname{Im} z = 0$$

b) $\{z \mid |z| = R\}$ aylana

c) $\{z \mid |z| = R, \operatorname{Re} z = 0\}$ aylana

d) $\{z \mid |z| = R, \operatorname{Im} z = 0\}$ aylana

11. Amallarni bajaring. $(1+i)^{10}$

a) 32

b) $\frac{\pi}{2}$

c) $32i$

d) $-32i$

12. $z = \frac{1-i}{1+i}$ sonning argumentini toping.

a) $\arg z = \frac{2\pi}{3}$

b) $\arg z = \frac{3\pi}{2}$

c) $\arg z = \frac{3\pi}{4}$

d) $\arg z = \frac{\pi}{3}$

13. $z = \frac{1}{1+i} + \frac{1}{1-i}$ sonning haqiqiy va mavhum qismlarini toping.

a) $\operatorname{Re} z = 1; \operatorname{Im} z = 1$

b) $\operatorname{Re} z = e; \operatorname{Im} z = 0$

c) $\operatorname{Re} z = 1; \operatorname{Im} z = 0$

d) $\operatorname{Re} z = -1; \operatorname{Im} z = -2$

14. $z = 2 + 3i$ nuqta uchun $x = 0$ chiziqqa nisbatan simmetrik bo'lgan nuqtani toping.

- a) $-3i$
- b) $-2 - 3i$
- c) $-2 + 3i$
- d) $2 + 3i$

15. Ushbu $y' + 3y = 3$ chiziqli bir jinsli bo'lmagan differensial tenglamaning xususiy yechimining ko'rinishini aniqlang.

- a) $y = Ax^2$
- b) $y = (Ax + B)x$
- c) $y = Ax$
- d) $y = Ax + B$

16. Xarakteristik tenglamaning ushbu $\lambda_1 = 1$, $\lambda_2 = 2$ ildizlari va o'ng tomoni $f(x) = e^{-x}(ax + b)$ ma'lum bo'lgan holda chiziqli bir jinsli bo'lmagan differensial tenglamaning xususiy yechimi qanday ko'rinishda bo'ladi?

- a) $y = (Ax + B)e^{2x}$
- b) $y = (Ax + B)e^{-x}$
- c) $y = (Ax + B)e^x$
- d) $y = Axe^{-x}$

17. $\int_0^2 \int_0^3 (x^2 + 2xy) dy dx$ takroriy integralni hisoblang.

- a) 30
- b) 27
- c) 26
- d) 36

18. Hisoblang $\int_0^{\frac{\pi}{2}} \int_0^1 r \cos \varphi dr d\varphi$

- a) 2
- b) 1
- c) -1

d) $\frac{1}{2}$

19. Hisoblang $\int_0^1 \int_0^x \int_0^{xy} z \, dz \, dy \, dx$

a) $\frac{1}{36}$

b) 0

c) 1

d) -1

20. Hisoblang $\int_D 1 \, dx \, dy$, bunda $D = \{x^2 + y^2 \leq 1\}$.

a) 2

b) 0

c) π

d) 2π

21. Hisoblang $\int_D 1 \, dx \, dy$, bunda $D = \{0 \leq x \leq 2, 0 \leq y \leq 2\}$.

a) 3

b) 2

c) 1

d) 4

22. $\int_0^1 \int_0^1 \int_0^1 (3x + y + 2z) \, dz \, dy \, dx$ takroriy integralni hisoblang.

a) -2

b) 3

c) -3

d) 2

23. Hisoblang $\int_0^1 \int_0^1 (x + y) \, dy \, dx$

a) 2

b) 0

c) 1

d) -1

24. $\int_{(0;0)}^{(1;1)} 2xydx + x^2dy$ ikkinchi tur egri chiziqli integralni hisoblang. Bunda $y = x^3$

a) 2

b) 0

c) -2

d) 1

25. Koshi masalasini yeching $y \operatorname{ctgx} + y = 2$; $y(0) = -1$

a) $y = 1 - 2 \cos x$

b) $y = \sin x - 1$

c) $y = 2 - 3 \cos x$

d) $y = \cos x - 2$

26. Koshi masalasini yeching $xy' + y = y^2$; $y(1) = 0,5$

a) $y = 1,5 - x$

b) $y = \frac{1}{1-2x}$

c) $y(1+x) = 1$

d) $y = \frac{2}{3+x}$

27. $\vec{a}$ va $\vec{b}$ vektorlarning skalyar ko'paytmasi quyidagicha bo'ladi

a) $\vec{a} \vec{b} = |\vec{a}| |\vec{b}| \operatorname{tg} \varphi$

b) $\vec{a} \vec{b} = |\vec{a}| |\vec{b}| \sin \varphi$

c) $\vec{a} \vec{b} = |\vec{a}| |\vec{b}| \cos \varphi$

d) $\vec{a} \vec{b} = |\vec{a}| |\vec{b}| \operatorname{ctg} \varphi$

28. $\vec{a}$ va $\vec{b}$ vektorlar orasidagi burchak quyidagi formula yordamida aniqlanadi:

$$\text{a) } \cos \varphi = \frac{\vec{a} \cdot \vec{b}}{|\vec{a}| |\vec{b}|}$$

$$\text{b) } \sin \varphi = \frac{|\vec{a}| |\vec{b}|}{\sqrt{a^2} \sqrt{b^2}}$$

$$\text{c) } \operatorname{ctg} \varphi = \frac{\vec{a} \cdot \vec{b}}{\sqrt{a^2} \sqrt{b^2}}$$

$$\text{d) } \operatorname{tg} \varphi = \frac{|\vec{a} \times \vec{b}|}{|\vec{a}| |\vec{b}|}$$

29. Ixtiyoriy $\vec{a}$ va $\vec{b}$ vektorlar uchun quyidagi munosabatlardan qaysi biri o'rinli.

$$\text{a) } (\vec{a} \cdot \vec{b})^2 > a^2 b^2$$

$$\text{b) } (\vec{a} \cdot \vec{b})^2 = a^2 b^2$$

$$\text{c) } (\vec{a} \cdot \vec{b})^2 < a^2 b^2$$

$$\text{d) } (\vec{a} \cdot \vec{b})^2 \leq a^2 b^2$$

30. Koordinatalari bilan berilgan $\vec{a}$ va $\vec{b}$ vektorlarning vektor ko'paytmasi quyidagicha bo'ladi:

$$\text{a) } \vec{a} \times \vec{b} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{vmatrix} = \vec{i} \begin{vmatrix} a_2 & a_3 \\ b_2 & b_3 \end{vmatrix} - \vec{j} \begin{vmatrix} a_1 & a_3 \\ b_1 & b_3 \end{vmatrix} + \vec{k} \begin{vmatrix} a_1 & a_2 \\ b_1 & b_2 \end{vmatrix}$$

$$\text{b) } [\vec{a}, \vec{b}] = |\vec{a}| |\vec{b}| \cos \varphi$$

$$\text{c) } \vec{a} \times \vec{b} = \sqrt{a_1^2 + a_2^2 + a_3^2} \cdot \sqrt{b_1^2 + b_2^2 + b_3^2} \sin \varphi$$

$$\text{d) } \vec{a} \times \vec{b} = \sqrt{a_1^2 + a_2^2 + a_3^2} \cdot \sqrt{b_1^2 + b_2^2 + b_3^2} \cos \varphi$$

31. $\vec{a}$ va $\vec{b}$ vektorlarning vektor ko'paytmasi bo'lgan vektorning uzunligi quyidagiga teng.

$$\text{a) } |[\vec{a}, \vec{b}]| = |\vec{a}| |\vec{b}| \operatorname{tg} \varphi$$

$$\text{b) } |[\vec{a}, \vec{b}]| = |\vec{a}| |\vec{b}| \cos \varphi$$

$$\text{c) } |[\vec{a}, \vec{b}]| = |\vec{a}| |\vec{b}| \operatorname{ctg} \varphi$$

d) $[\vec{a}, \vec{b}] = |\vec{a}||\vec{b}|\sin \varphi$

32. $\vec{a}$ va $\vec{b}$ vektorlarning ortogonallik shartini ko'rsating.

a) $[\vec{a}, \vec{b}] = 0$

b) $\vec{a} \cdot \vec{b} = 0$

c) $\vec{a} + \vec{b} = 0$

d) $\vec{a} - \vec{b} = 0$

33. $\vec{a}$ va $\vec{b}$ vektorlarning kollinearlik shartini ko'rsating.

a) $\vec{a}\vec{b}\vec{c} = 0$

b) $\vec{a} + \vec{b} + \vec{c} = 0$

c) $[\vec{a}, \vec{b}] = 0$

d) $\vec{a} + \vec{b} = 0$

34. $\vec{a}, \vec{b}, \vec{c}$ vektorlarning komplanarlik shartini ko'rsating.

a) $(\vec{a} - \vec{b}) \cdot \vec{c} = 0$

b) $\vec{a}\vec{b}\vec{c} = 0$

c) $(\vec{a} + \vec{b}) \cdot \vec{c} = 0$

d) $(\vec{a} \cdot \vec{b})\vec{c} = 0$

35. $\vec{a} = 4\vec{i} + 7\vec{j} + 3\vec{k}$ va $\vec{b} = 3\vec{i} - 5\vec{j} + \vec{k}$ vektorlarning skalyar ko'paytmasi

quyidagiga teng.

a) $\vec{a}\vec{b} = -20$

b) $\vec{a}\vec{b} = 20$

c) $\vec{a}\vec{b} = -50$

1. s_z tekislikdagi $z_1 = 2 + 3i$ nuqta uchun $y = 0$ chiziqqa nisbatan simmetrik bo'lgan nuqtani toping.

a) $2 + 3i$

b) $-2 - 3i$

c) $2 - 3i$

d) $-3i$

2. $\{|z - 1| < 2\}$ sohaning $w = \frac{z+1}{z-2}$ akslantirish yordamida aksini toping. .

a) $|w - 2| > 4$

b) $|w - 2| < 2$

c) $|w - 2| > 2$

d) $|w - 2| < 4$

3. $w = \frac{1}{z}$ akslantirish yordamida $x^2 + y^2 = ax$ doiralarning oilasining aksini toping.

a) $u = \frac{1}{a}$ to'g'ri chiziqlar oilasi

b) $u^2 = -v^2 + 2u$ aylanalar oilasi

c) $u > a$ yarim tekisliklar oilasi

d) $u = a$ to'g'ri chiziqlar oilasi

4. $w = \frac{1}{z}$ akslantirish yordamida $x^2 + y^2 = ax$ aylanalar oilasining aksini toping.

a) $u = \frac{1}{a}$ to'g'ri chiziqlar oilasi

b) $u^2 = -v^2 + 2u$ aylanalar oilasi

c) $u > a$ yarim tekisliklar oilasi

d) $u = a$ to'g'ri chiziqlar oilasi

5. $w = \frac{1}{z}$ akslantirish yordamida $y = kx$ to'g'ri chiziqlar oilasining aksini toping.

a) $v = \frac{1}{k}u$

b) $v = -ku$

c) $v = \frac{k}{u}$

d) $v = -ku$

6. Qo'zg'almas nuqta nima.

a) $f(z) = a$ tenglikni qanoatlantiruvchi nuqta

b) S tekislikdagi ixtiyoriy nuqta

c) $f(a) = a$ tenglikni qanoatlantiruvchi nuqta

d) $z = \infty$ tenglikni qanoatlantiruvchi nuqta

7. $|z - 1| < 2$ sohaning $w = 1 - 2iz$ akslantirish yordamidagi aksini toping.

- a) $|w - 1 + 2i| > 4$
- b) $|w + 1 - 2i| < 4$
- c) $|w - 1 + 2i| < 4$
- d) $|w - 1 + 2i| < 2$

8. $w = z^2 - 2z$ funksiyag 23 dagi so'zlar yoziladi.

- a) $|z - 1| = 2$
- b) $|z + 1| = \frac{1}{2}$
- c) $|z + 1| = 2$
- d) $|z| = \frac{1}{2}$

9. $W = z^2 + 2z$ akslantirish uchun $z_0 = 1$ nuqtadagi cho'zilish koeffitsentli va burilish burchagini toping.

- a) $2\sqrt{2}\alpha(\varphi) = \frac{\pi}{4}$
- b) $R(\varphi) = 2\sqrt{2}\alpha(\varphi) = \frac{\pi}{2}$
- c) $R(\varphi) = -2\sqrt{2}\alpha(\varphi) = \frac{\pi}{4}$
- d) $R(\varphi) = \sqrt{2}\alpha(\varphi) = \frac{\pi}{4}$

10. $v(x, y) = 3x^2y - y^3$ tenglik bilan berilgan $f(z) = U(x, y) + iv(x, y)$ golmorf funksiyani toping.

- a) $f(z) = z^3 + ci$
- b) $f(z) = z^3 + c$
- c) $f(z) = z^2 + c$
- d) $f(z) = z^3 + z + c$

11. $U(x, y) = xy + 1$) garmonik funksiyaga s da qo'shma garmonik funksiyani toping?

- a) $v(x, y) = x^2 + y^2 + c$
- b) $U(x, y) = x^2 - y^2 + c$

c) $v(x, y) = -\frac{1}{2}(x^2 - y^2) + c$

d) $v(x, y) = \frac{1}{2}(x^2 - y^2) + c$

12. $U = x^2 - y^2 + x$ garmonik funksiyaga s da qo'shma garmonik funksiyani toping?

a) $v(x, y) = y + 2xy + c$

b) $U(x, y) = 2xy - y + c$

c) $v(x, y) = 2xy + y + c$

d) $v(x, y) = y - 2xy + c$

13. Ushbu $xy' = \sqrt{x^2 - y^2} + y$ tenglama qaysi turdagi tenglama?

a) To'la differensialli tenglama

b) Bir jinsliga keltiriladigan tenglama

c) Bir jinsli tenglama

d) Chiziqli tenglama

14. Ushbu $\lambda(\lambda+1)(\lambda+2) = 0$ ko'rinishdagi xarakteristik tenglamani bilgan holda chiziqli bir jinsli tenglamani tuzing

a) $y''' - 2y' = 0$

b) $y''' + 2y'' - y' = 0$

c) $y''' + 3y'' + 2y' = 0$

d) $y''' + y'' = 0$

15. Quyidagi tenglamalarlardan qaysi biri to'la differensialli tenglama bo'ladi?

a) $(3x^2 - 2x - y)dx + (2y - x + 3y^2)dy = 0$

b) $(x - 2xy - y^2)y' + y^2 = 0$

c) $(x - 2y - 1)dx + (3x - 6y + 2)dy = 0$

d) $(4x - 3y)dx + (2y - 3x)dy = 0$

16. Qaysi shartda $P(x, y)dx + Q(x, y)dy$ ifoda to'la differensial ifoda bo'ladi?

a) $\frac{\partial P}{\partial y} = \frac{\partial Q}{\partial x}$ bo'lganda

b) $\frac{\partial P}{\partial x} = \frac{\partial Q}{\partial y}$ bo'lganda

c) $P(x, y)dx + Q(x, y)dy = 0$ bo'lganda

d) $\frac{\partial P}{\partial y} = \frac{\partial Q}{\partial x}$ bo'lganda

17. $\int_D 4(x + y - z)dx dy dz$ uch o'lchovli integralni hisoblang. D- $x=0, x=1, y=0, y=1, z=0, z=1$ tekisliklar bilan chegaralangan jism.

a) -5/7

b) 1/2

c) 2

d) -3/8

18. $x^2 + y^2 = 1$ silindr, $x + y + z = 3$, $z = 0$ tekisliklar bilan chegaralangan jismning hajmini hisoblang.

a) 1/6

b) 1/4

c) 1/3

d) 3π

19. $\int_{(0,0)}^{(1,1)} 6xydx + 3x^2dy$ egri chiziqli integralni hisoblang. Bunda $y=x$.

a) 1

b) -1

c) 3

d) 0

20. $\int_L 5ydx + 5xdy$ ikkinchi tur egri chiziqli integralni hisoblang. Bunda

$x = R \cos t, \quad y = R \sin t$ – aylana.

- a) $-1/8$
- b) $-2/5$
- c) $-1/2$
- d) 0

21. Quyidagi egri chiziqli integrallarning qaysi biri integrallash yo'liga bog'liq

emas. 1) $\int_L 2xdx + 3ydy$, 2) $\int_L 2ydx + 2xdy$, 3) $\int_L (x+y)dx + ydy$.

- a) 1),2)
- b) 1)
- c) 2),3)
- d) 3)

22. Funksiyaning to'la diffuensial bo'yicha uning o'zini

tiklang; $du = 2\cos x dx + 2\sin y dy$.

- a) $u = y\cos x$,
- b) $u = \cos x \sin y - c$
- c) $u = 2\sin x - 2\cos y + c$
- d) $u = x\sin y$

23. $\int_L 2(x^2 + y^2) ds$ birinchi tur egri chiziqli integralni hisoblang. $L - x = R\cos t$,

$y = R\sin t$ aylana.

- a) $2\pi R^2$
- b) $4\pi R^3$
- c) $2\pi R$
- d) πR^2

24. Ikki o'lchovli integral yordamida $x+y+z=4$, $x=0$, $y=0$, $z=0$ tekisliklar bilan chegaralangan piramidaning chorak hajmini toping.

- a) $1/3$
- b) $2/3$
- c) $8/3$
- d) $1/7$

25. $\frac{1}{2z-1}$ funksiyani Makloren qatoriga yoying, qatorning yaqinlashish radiusini toping

a) $\sum_{n=0}^{\infty} 2^n z^n, R = \frac{1}{2}$

b) $-\sum_{n=0}^{\infty} 2^n z^n, R = \frac{1}{2}$

c) $-\sum_{n=0}^{\infty} 2^n z^n, R = 1$

d) $\sum_{n=0}^{\infty} 2^n z^n, R = 1$

26. $3x + 4y + 1 = 0$ va $4x - 3y - 5 = 0$ to'g'ri chiziqlar orasidagi burchak quyidagilardan biriga teng.

a) $\varphi = 60^\circ$

b) $\varphi = 90^\circ$

c) $\varphi = 30^\circ$

d) $\varphi = 0^\circ$

27. $y = 3x - 5$ to'g'ri chiziqning absissasi $x_0 = -4$ ga teng bo'lgan nuqtaning ordinatasi y_0 ni toping.

a) 17

b) -4

c) -17

d) 7

28. $C(3;2)$ nuqtaga koordinata boshiga nisbatan simmetrik bo'lgan nuqtani toping.

a) (2;3)

b) (3;2)

c) (3;-2)

d) $(-3;-2)$

29. $M \left(6; \frac{\pi}{2} \right)$ nuqta kutb koordinatalarida berilgan, uning dekart kordinatalarini

toping.

a) $(-2;4)$

b) $(3;-2)$

c) $(6;0)$

d) $(0;6)$

30. Uchlari $A(0;0)$, $B(4;0)$, $C(0;6)$ nuqtalarda bo'lgan uchburchakning yuzini

toping.

a) 12

b) 6

c) 13

d) 14

31. Absissa o'qida $A(-3;4;-8)$ nuqtadan 12 birlik uzaklikda bo'lgan nuqtani

toping.

a) $(5;0;0)$ va $(-11;0;0)$

b) $(-3;0;0)$ va $(2;0;0)$

c) $(+5;0;0)$ va $(5;0;0)$

d) $(+3;0;1)$ va $(-11;2;1)$

32. Uchlari $A(-2;0)$, $B(0;7)$, $C(0;0)$ nuqtalarda bo'lgan uchburchakning

yuzini toping.

a) 9

b) 3

c) 7

d) 14

33. $A(1;-3)$, $B(3;-5)$ nuqtalar AB kesmaning uchlari bo'lsa, kesma o'rtasining koordinatalarini toping.

a) $(2;-4)$

b) $(0;2)$

c) $(3;-4)$

d) $(2;-2)$

34. Agar $\vec{a} = \{1;3;-1\}$, $\vec{b} = \{2;1;4\}$ bo'lsa $\vec{c} = \vec{a} + \vec{b}$ ni toping.

a) $\vec{c} = \{3;4;3\}$

b) $\vec{c} = \{0;2;1\}$

c) $\vec{c} = \{5;0;3\}$

d) $\vec{c} = \{2;3;-1\}$

35. $A = (3;1;5)$, $B = (1;2;2)$ bo'lsa $\overrightarrow{AB}$ vektorining koordinatalarini toping.

a) $\{1;2;3\}$

b) $\{0;1;4\}$

c) $\{-1;2;3\}$

1. $w = z^2$ funksiyaning $z_0 = 1$ nuqtadagi cho'zilish koeffitsientli $R(\varphi)$ va burilish burchagini $\alpha(\varphi)$ ni toping.

a) $R(\varphi) = 2 \quad \alpha(\varphi) = \pi$

b) $R(\varphi) = \frac{1}{2} \alpha(\varphi) = 0$

c) $R(\varphi) = 2 \quad \alpha(\varphi) = \frac{\pi}{2}$

d) $R(\varphi) = 2: \alpha(\varphi) = 0$

2. $f(z) = 2z + 1$ funksiyaning hosilasini toping.

a) 1

b) $2x$

c) $2y$

d) $2z \in C$

3. $f(z) = |z|^2 [Re z]^2$ funksiyaning haqiqiy qismini toping.

a) $U(x, y) = x^2 + y^2$

b) $U(x, y) = (x^2 + y^2) x^2$

c) $U(x, y) = x^2 + y^2 y^2$

d) $U(x, y) = x^2 - y^2 x^2$

4. $f(z) = e^z$ funksiya bir yaproqli, bo'lmagan sohani toping.

- a) $\operatorname{Im} z < 0$
- b) $\operatorname{Im} z > 0$
- c) $0 < \operatorname{Re} z < 1$
- d) $|z| < 1$

5. $f(z) = \bar{z}^2$ funksiyaning haqiqiy va mavhum qismlarini toping.

- a) $u(x, y) = x^2 - y^2, v(x, y) = 2xy$
- b) $u(x, y) = x^2 - y^2, v(x, y) = -2xy$
- c) $u(x, y) = x^2 + y^2, v(x, y) = -2xy$
- d) $u(x, y) = x^2 + y^2, v(x, y) = 2xy$

5. $f(z) = \frac{1}{z+2}$ funksiya bir yaproqli, bo'lmagan sohani toping.

- a) $\operatorname{Re} z > 3$
- b) $|z| > 0$
- c) $\operatorname{Im} z > 0$
- d) $|z| < 2$

6. $f(z) = \frac{1}{2} \left(z + \frac{1}{z} \right)$ funksiya bir yaproqli, bo'lgan sohani toping.

- a) $|z| < 2$
- b) $\operatorname{Re} z > 0$
- c) $\operatorname{Im} z > 0$
- d) $\frac{\pi}{2} < \arg z < \frac{3\pi}{2}$

7. $f(z) = z^2$ funksiya quyida keltirilgan sohalarning qaysi birida bir yaproqli.

- a) $|z| < 1$
- b) $|z| > 2$
- c) $0 < \arg z < \frac{\pi}{2}$
- d) $-\frac{\pi}{2} < \arg z < \frac{\pi}{2}$

8. $M(z)$ nuqtaning S sferasidagi koordinatalari (ζ, η, ξ) bo'lsa $M(-z)$ ning koordinatlarini toping.

- a) $-\zeta, -\eta, \xi$
- b) $-\zeta, \eta, \xi$
- c) ζ, η, ξ
- d) $-\zeta, -\eta, -\xi$

9. Markazi $z = 1$ nuqtada va radiusi 1 ga teng bo'lgan yopiq doiraning tashqarisi.

- a) $\{z | z > 1\}$
- b) $\{z | z < 1\}$
- c) $\{z | z < -1\}$
- d) $\{z | z > -1\}$

10. Qatorning yaqinlashish sohasini toping: $\sum_{n=0}^{\infty} \frac{z^n}{2^{n-1}} + \sum_{n=1}^{\infty} \frac{i^{n+1}}{z^n}$

- a) $|z| < 1$
- b) $|z| > 1$
- c) $1 < |z| < 2$
- d) $\frac{1}{2} < |z| < 1$

11. Dekart koordinatalar sistemasi bilan sferik koordinatalar sistemasi orasidagi munosabatni ifodalovchi formulani ko'rsating.

$$x = r \sin \theta \cos \varphi, y = r \sin \theta \sin \varphi, \\ z = r \cos \theta;$$

- a) $0 < \varphi < 2\pi, 0 < \theta < \pi, 0 < r < +\infty$

$$x = r \sin \theta \cos \varphi, y = r \sin \theta \sin \varphi, \\ z = r \cos \theta;$$

- b) $0 < \varphi < 2\pi, 0 < \theta < \pi, 0 < r < +\infty$

$$x = r \cos \varphi, y = r \sin \varphi, \\ z = r \cos \theta;$$

- c) $0 < \varphi < 2\pi, 0 < \theta < \pi, 0 < r < +\infty$

$$x = r \sin \theta \cos \varphi, y = r \sin \theta \sin \varphi, \\ z = r \sin \theta;$$

d) $0 \leq \varphi < 2\pi, 0 \leq \theta < \pi, 0 \leq r < +\infty$

12. Dekart koordinatalar sistemasi bilan silindrik koordinatalar sistemasi orasidagi munosabatni ifodalovchi formulani ko'rsating.

$$x = r \cos \varphi, y = r \sin \varphi, z = z;$$

a) $0 \leq \varphi < 2\pi, 0 \leq r < +\infty$

$$x = r, y = \sin \varphi, z = z;$$

b) $0 \leq \varphi < 2\pi, 0 \leq r < +\infty$

$$x = r \cos \varphi, y = r \sin \varphi, z = z;$$

c) $0 \leq \varphi < 2\pi, 0 \leq r < +\infty$

$$x = r \cos \varphi, y = r, z = z;$$

d) $0 \leq \varphi < 2\pi, 0 \leq r < +\infty$

13. Dekart koordinatalari sistemasi bilan qutb koordinatalar sistemasi orasidagi munosabatni ifodalovchi formulani ko'rsating.

$$x = r, y = r \sin \varphi;$$

a) $0 \leq \varphi < 2\pi, 0 \leq r < +\infty$

$$x = r \cos \varphi, y = r;$$

b) $0 \leq \varphi < 2\pi, 0 \leq r < +\infty$

$$x = r, y = \sin \varphi;$$

c) $0 \leq \varphi < 2\pi, 0 \leq r < +\infty$

$$x = r \cos \varphi, y = r \sin \varphi;$$

d) $0 \leq \varphi < 2\pi, 0 \leq r < +\infty$

14. $y = \frac{3x}{x^2 - 4}$ Funksiya qaysi nuqtada uzilishga ega ?

a) $x = 0$

b) $x = \pm 2$

c) $x = 1$

d) $x = -1$

15. $x = x_0$ nuqta $f(x)$ funksiyaning 1-tur uzulish nuqtasi deyiladi, agarda ...

a) $\lim_{x \rightarrow x_0} f(x) \text{ mavjud}, \lim_{x \rightarrow x_0} f(x) \neq f(x_0)$

b) $f(x_0) < f(x)$

c) $f(x_0 - 0)$ va $f(x_0 + 0)$ lar mavjud, $f(x_0 - 0) = f(x_0 + 0)$

d) $f(x_0 - 0)$ mavjud emas

16. $x = x_0$ nuqta $f(x)$ funksiya uchun bartaraf qilish mumkin bo'lgan nuqta agarda....

a) $f(x_0 - 0)$ va $f(x_0 + 0)$ lar mavjud, $f(x_0 - 0) = f(x_0 + 0)$

b) $f(x_0) < f(x)$

c) $f(x_0 - 0)$ mavjud emas

d) $\lim_{x \rightarrow x_0} f(x)$ mavjud, $\lim_{x \rightarrow x_0} f(x) = f(x_0)$

17. Massasi 10 kg bo'lgan jism $s(t) = t^2 + 2t + 3$ qonuniyat bilan to'g'ri chiziqli harakatlanmoqda. Jismning $t=3$ s vaqtidagi kinetik energiyasini aniqlang.

a) 320J

b) 3200 J

c) 340 J

d) 250 J

18. Quyidagi hollarning qaysi birida $f(x)$ funksiya $(a;b)$ da kamayuvchi bo'ladi?

a) $(a;b)$ da $f'(x) > 0$

b) $(a;b)$ da $f'(x) < 0$

c) $(a;b)$ da $f'(x) < 0$

d) $(a;b)$ da $f'(x) > 0$

19. Quyidagi hollarning qaysi birida $f(x)$ funksiya $(a;b)$ da qavariq bo'ladi?

a) $(a;b)$ da $f'(x) > 0$

b) $(a;b)$ da $f'(x) < 0$

c) $(a;b)$ da $f''(x) < 0$

d) $(a;b)$ da $f''(x) > 0$

20. Quyidagi funksiylarning qaysi birlari o'z aniqlanish sohasida kamayuvchi

bo'ladi. 1) $f(x)=3-4x$; 2) $f(x)=1-x^2$; 3) $f(x)=\sin x$; 4) $f(x)=-x^3$

a) 1 va 4

b) 1 va 3

c) 2 va 4

d) 2 va 3

21. Agar $xy > 0$ bo'lsa $M(x, y)$ nuqta qaysi chorakda joylashgan?

a) II va III

b) I va III

c) III va IV

d) I va IV

22. Agar $xy < 0$ bo'lsa $M(x, y)$ nuqta qaysi chorakda joylashgan?

a) II va IV

b) I va III

c) III va IV

d) I va IV

23. Ordinata o'qida $A(1;-3;7)$ va $B(5;7;-5)$ nuqtalardan bir xil uzoqlikdagi nuqtani toping.

a) $C(0;4;0)$

b) $C(0;-2;0)$

c) $C(0;-5;0)$

d) $C(0;2;0)$

24. Parallelogramm uchta uchining koordinatalari $A(3;-5)$, $B(5;-3)$, $C(-1;3)$ berilgan, uning to'rtinchi uchi D nuqtaning koordinatalarini toping.

a) $D(0;-1)$

b) $D(-4;1)$

c) $D(-4;-1)$

d) $D(-3;1)$

25. $\vec{a}$ va $\vec{b}$ o'zaro perpendikulyar vektorlar bo'lib agar, $|\vec{a}| = 3$, $|\vec{b}| = 4$ bo'lsa,

$|\vec{a} + \vec{b}|$ ni toping.

a) $|\vec{a} + \vec{b}| = 0$

b) $|\vec{a} + \vec{b}| = 1$

c) $|\vec{a} + \vec{b}| = 5$

d) $|\vec{a} + \vec{b}| = 2$

26. $|\vec{a}| = 3$, $|\vec{b}| = 2$, $(\vec{a}, \vec{b}) = 120^\circ$ bo'lsa $|\vec{a} + 2\vec{b}|$ ni toping.

a) $\sqrt{15}$

b) $\sqrt{37}$

c) $\sqrt{23}$

d) $\sqrt{13}$

27. $\vec{a} = \{2; 1; 0\}$ va $\vec{b} = \{0; -2; 1\}$ vektorlarga yasalgan parallelogrammning diagonallari orasidagi burchakni toping.

a) 45°

b) 0°

c) 60°

d) 90°

28. $\vec{a} = \{3; 0; -4\}$ va $\vec{b} = \{1; -2; 2\}$ vektorlar orasidagi burchak sinusini toping.

a) $\frac{2\sqrt{2}}{3}$

b) $\frac{2\sqrt{3}}{3}$

c) $\frac{2}{3}$

d) $\frac{3}{4}$

29. $\vec{a}\vec{b} = 42$ bo'lgan holda, $\vec{a} = \{4; 2; -1\}$, vektorga kollinear $\vec{b}$ vektorni toping.

a) $\vec{b} = \{2; 1; -1\}$

b) $\vec{b} = \{8; 4; -2\}$

c) $\vec{b} = \{-4; -2; 1\}$

d) $\vec{b} = \{2; 4; -1\}$

30. $\vec{a} = \{-2; -1; 1\}$, $\vec{b} = \{4; -4; 1\}$, $\vec{c} = \{4; -6; 2\}$ vektorlarning aralash

ko'paytmasini toping

a) 12

b) 6

c) 0

d) 4

31. $\vec{a} = \{-1; 3; 4\}$, $\vec{b} = \{2; 5; 2\}$, $\vec{c} = \{1; 2; 3\}$ vektorlarga yasalgan

parallelipepedning hajmini toping.

a) 27

b) -27

c) 54

d) 13,5

32. Parallelogramm uchta uchining koordinatalari berilgan; $A(-2; 3)$,

$B(4; -5)$, $C(-3; 1)$ parallelogrammning yuzi nimaga teng.

a) 49

b) 22

c) 16

d) 20

33. $\vec{a} = \{2; -3; -1\}$ vektor oxirining koordinatalari $(1; -1; 2)$ nuqtada bo'lsa,

boshining koordinatalarini toping.

a) $(-1; 2; 3)$

b) $(-1; 3; 2)$

c) $(0; -1; 2)$

d) $(3; 2; -1)$

34. $M(0; -4)$ nuqtaning qutb koordinatasini toping.

a) $4; \frac{\pi}{4}$

b) $4; \frac{\pi}{2}$

c) $(4; 45^0)$

d) $4; \frac{3\pi}{2}$

35. $A(-2; 2)$, $M(1; -1)$ nuqtalar berilgan. Koordinata boshidan va AB kesmanin o'rtasidan o'tuvchi to'g'ri chiziq tenglamasini tuzing.

a) $x - 2y = 0$

b) $x + y = 0$

c) $x + 2y = 0$

1. Haqiqiy o'qdan yuqorida joylashgan tekislik tenglamasi.

a) $\{\operatorname{Re} z = 2\}$

b) $\{\operatorname{Re} z = 2\}$

c) $\{\operatorname{Re} z = 0\}$

d) $\{\operatorname{Im} z = 2\}$

2. Haqiqiy o'qdan yuqorida va undan 2 birlik masofa uzoqlikda joylashgan yarim tekislik

a) $\{\operatorname{Im} z = 2\}$

b) $\{\operatorname{Re} z = 2\}$

c) $\{\operatorname{Re} z = 2\}$

d) $\{\operatorname{Im} z = 2\}$

3. Markazi $z = 0$ nuqtada, radiusi 1 ga teng bo'lgan va mavhum o'qdan chap tomonda joylashgan yarim doira.

a) $\{|z| < 1, \operatorname{Re} z < 0\}$

b) $\{|z| < 0, \operatorname{Im} z < 1\}$

c) $\{|z| < 1, \operatorname{Im} z < 0\}$

d) $\{|z| < 0, 0 < \operatorname{Re} z\}$

4. Ixtiyoriy nuqtasidan mavhum o'qqacha bo'lgan masofa 1 dan kichik bo'lgan yo'lak

a) $\{\operatorname{Im} z < 1\}$

b) $\{0 < \operatorname{Re} z < 1\}$

c) $\{|\operatorname{Re} z| < 1\}$

d) $\{0 < \operatorname{Im} z < 1\}$

5. Mavhum o'qning o'ng tomonini ifodalovchi tekislik tenglamasi ?

a) $\{\operatorname{Re} z < 0\}$

b) $\{\operatorname{Im} z < 0\}$

c) $\{\operatorname{Im} z = 0\}$

d) $\{\operatorname{Re} z > 0\}$

6. $w = f(z)$ funksiya $|z - 2| < 1$ doirani $|w - 2i| < 2$ birlik doiraga

$f(2) = i$, $\arg f'(2) = 0$ shartlari bilan konform akslantirsin. U holda

$f(3/2) =$ ni hisoblang.

a) i

b) $(5i + 1)/2$

c) $(-13 + 16i)/15$

d) $(-12 + 14i)/17$

7. $w = f(z)$ funksiya $|z| < 1$ doirani $|w - 1| < 1$ birlik doiraga $f(0) = 1/2$,

$f(1) = 0$ shartlari bilan konform akslantirsin. U holda $f(1/2) =$

- a) $1/5$
- b) $1/4$
- c) $1/3$
- d) $1/6$

8. $\cos z$ funksiyaning faqat mavhum qiymatlar qabul qiladigan z nuqtalari to'plamini toping.

- a) $\operatorname{Im} z = 0 \quad \operatorname{Re} z = 2k\pi \quad k = 0, \pm 1, \pm 2, \dots$
- b) $\operatorname{Im} z = 0 \quad \operatorname{Re} z = k\pi \quad k = 0, \pm 1, \pm 2, \dots$
- c) $\operatorname{Im} z = 0 \quad \operatorname{Re} z = (k + 1/2)\pi \quad k = 0, \pm 1, \pm 2, \dots$
- d) $\operatorname{Im} z = 1 \quad \operatorname{Re} z = k\pi \quad k = 0, \pm 1, \pm 2, \dots$

9. $w = 2z - 1$ funksiyaning haqiqiy qismini toping .

- a) $U(x, y) = 2x$
- b) $U(x, y) = 2y - 1$
- c) $U(x, y) = 2x - 1$
- d) $U(x, y) = 2x + 1$

10. $w = f(z)$ funksiya $|z| < 1$ doirani $|w| < 1$ birlik doiraga $f(1/2) = 0$, $\arg f'(1/2) = 0$ shartlari bilan konform akslantirsin. U holda $f(0) =$

- a) $i/2$
- b) $-1/2$
- c) $-i/2$
- d) $1/2$

11. $w = f(z)$ funksiya $|z| < 2$ doiraga $\operatorname{Re} w > 0$ o'ng yarim tekislikni

$f(0) = 1, \arg f'(0) = \frac{\pi}{2}$ shartlari bilan konform akslantirsin. U holda

$f(i) =$ nimaga teng bo'ladi.

- a) $1/5$
- b) $1/4$
- c) $1/3$
- d) $1/6$

12. $w = f(z)$ funksiya $\text{Im} z > 0$ yuqori yarim tekislikni $|w - 1| < 1$ doiraga $f(i) = 1$, $\arg f'(i) = 0$ shartlari bilan konform akslantirsin. U holda $f(2i) =$

- a) $(i - 3)/3$
- b) $(3 - i)/3$
- c) $(i + 3)/3$
- d) $-(i + 3)/3$

13. $w = f(z)$ funksiya $\text{Im} z > 0$ yuqori yarim tekislikni $|w| < 1$ birlik doiraga $f(1 + i) = 0$, $\arg f'(1 + i) = -\frac{\pi}{2}$ shartlari bilan konform akslantirsin. U holda $f(2i) =$

- a) $(i - 1)/(3i - 1)$.
- b) $(i - 1)/(3 + i)$
- c) $i/(5 - i)$
- d) $-i/(5 + i)$

14. $w = f(z)$ funksiya $\text{Im} z > 0$ yuqori yarim tekislikni $|w| < 1$ birlik doiraga $f(2i) = 0$, $\arg f'(2i) = 0$ shartlari bilan konform akslantirsin. U holda $f(3i) =$

- a) $1/3$
- b) $-i/4$
- c) $i/5$
- d) $-2/3$

15. Agar $f(x) = 2\sin x - 4\sqrt{3}\cos x$ bo'lsa, $f(\frac{\pi}{3})$ ni hisoblang.

- a) -5
- b) 7
- c) $2 + 4\sqrt{3}$
- d) 0

16. Integralni hisoblang: $\int \frac{dx}{1+x^2}$

a) $\frac{\pi\sqrt{2}}{2}$

b) $\frac{\pi\sqrt{2}}{4}$

c) π

d) 0

17. $f(x) = x + x^3$ funksiyaning hosilasini toping.

a) $f'(x) = 1 + x^2$

b) $f'(x) = 1 + 3x^2$

c) $f'(x) = 1 + 3x^3$

d) $f'(x) = 3 + 3x^2$

18. Agar $F(x)$ funksiya $f(x)$ funksiyaning boshlang'ich funksiyasi bo'lsa, quyidagi formulalardan qaysi biri to'g'ri? ($k \neq 0$)

a) $\int f(b-kx)dx = -\frac{1}{k}F(b-kx) + C$

b) $\int f(kx)dx = kF\left(\frac{1}{k}x\right) + C$

c) $\int f(b-kx)dx = \frac{1}{k}F(b-kx) + C$

d) $\int f(kx)dx = kF(x) + C$

19. $f(x) = x^2$ funksiyaning $M(-1;3)$ nuqtadan o'tuvchi boshlang'ich funksiyasini toping.

a) $F(x) = x^3 + 5/3$

b) $F(x) = x^3/3$

c) $F(x) = x^3/3 + 3$

d) $F(x) = x^3/3 + 10/3$

20. $\sin 3x \cos 3x dx$ ni hisoblang.

- a) $\frac{1}{12}\sin 6x + C$
- b) $-9\cos x \sin x + C$
- c) $-\frac{1}{12}\cos 6x + C$
- d) $\frac{1}{6}\cos 6x + C$

21. $\ln x dx$ ni toping.

- a) $x \ln x - x + C$
- b) $x \ln x + x + C$
- c) $x \ln x + C$
- d) $0,5 \ln^2 x + C$

22. Funksiyaning hosilasini toping: $f(x) = \frac{e^{2x}}{x^2 + 1}$

- a) $\frac{e^{2x} (x^2 - x + 1)}{(x^2 + 1)^2}$
- b) $\frac{e^{2x}}{x}$
- c) $\frac{2e^{2x} (x^2 - x + 1)}{(x^2 + 1)^2}$
- d) $\frac{2e^{2x} (x - x^2 + 1)}{(x^2 + 1)^2}$

23. Sodda ratsional kasrni ko'rsating.

- a) $\frac{3 - x}{x^2 + 2x - 3}$
- b) $\frac{x - 1}{x + 1}$
- c) $\frac{x + 6}{(x + 2)^2}$

d) $\frac{x-1}{x^2+x+1}$

24. $y = (x-3)(x^2+3x+9)$ funksiyaning $x=3$ nuqtadagi hosilasini toping.

a) 27

b) 0

c) 3

d) 9

25. Uchburchak uchlarining koordinatalri berilgan: $A(5; -3)$, $B(-3; 4)$, $C = (-2; -5)$. C uchidan tushirilgan balandligining tenglamasini tuzing.

a) $x + 3y - 3 = 0$

b) $x + y - 1 = 0$

c) $x - y = 0$

d) $8x - 7y - 19 = 0$

26. $M(5; 2)$ nuqtadan o'tib koordinata o'qlaridan bir xil kesma ajratadigan to'g'ri chiziq tenglamasini yozing.

a) $x + 3y - 8 = 0$

b) $x - y - 1 = 0$

c) $x + y - 7 = 0$

d) $x + y - 1 = 0$

27. $M(1; 2)$ nuqtaning $5x + 2y + 20 = 0$ to'g'ri chiziqdagi proektsiyasini toping.

a) (0; 10)

b) (-4; 0)

c) (1; 1)

d) (4; 0)

28. $12x - 5y - 26 = 0$ va $12x - 5y - 39 = 0$ parallel to'g'ri chiziqlar orasidagi masofani toping.

a) $d = 13$

b) $d = 2$

c) $d = 5$

d) $d = 1$

29. Qanday shart berilganda $ax + by + c = 0$ to'g'ri chiziq Oy o'qining musbat yarim o'qini kesib o'tadi?

a) $bc < 0$

b) $ab < 0$

c) $bc > 0$

d) $ac < 0$

30. β ning qanday kiymatida $\beta x + 3y + 5 = 0$ va $3x - 5y + 6 = 0$ to'g'ri chiziqlar o'zaro perpendikulyar bo'ladi?

a) $\beta = 1$

b) $\beta = 3$

c) $\beta = 4$

d) $\beta = 5$

31. $M(3; -4)$ nuqtaga $x + y = 0$ to'g'ri chiziqqa nisbatan simmetrik bo'lgan nuqtaning koordinatalari topilsin.

a) $(4; 3)$

b) $(-4; 3)$

c) $(4; -3)$

d) $(-3; -4)$

32. $\vec{a}$ va $\vec{b}$ o'zaro perpendikulyar vektorlar bo'lib agar, $|\vec{a}| = 3$, $|\vec{b}| = 4$ bo'lsa,

$|\vec{a} + \vec{b}|$ ni toping.

a) $|\vec{a} + \vec{b}| = 1$

b) $|\vec{a} + \vec{b}| = 5$

c) $|\vec{a} + \vec{b}| = 0$

d) $|\vec{a} + \vec{b}| = 2$

33. $|\vec{a}| = 3, |\vec{b}| = 2, (\vec{a}, \vec{b}) = 120^\circ$ bo'lsa $|\vec{a} + 2\vec{b}|$ ni toping.

a) $\sqrt{13}$

b) $\sqrt{15}$

c) $\sqrt{37}$

d) $\sqrt{23}$

34. $\vec{a} = \{2; 1; 0\}$ va $\vec{b} = \{0; -2; 1\}$ vektorlarga yasalgan parallelogrammning diagonallari orasidagi burchakni toping.

a) 45°

b) 0°

c) 60°

d) 90°

35. $\vec{a} = \{3; 0; -4\}$ va $\vec{b} = \{1; -2; 2\}$ vektorlar orasidagi burchak sinusini toping.

a) $\frac{2\sqrt{2}}{3}$

b) $\frac{2\sqrt{3}}{3}$

c) $\frac{2}{3}$

1. $w = f(z)$ funksiya $\text{Im} z > 0$ yuqori yarim tekislikni $|w| < 1$ birlik doiraga

$f(i) = 0, \arg f'(i) = -\frac{\pi}{2}$ shartlari bilan konform akslantirsin. U

holda $f(2i) =$ ni hisoblang.

a) $i/2$

b) $i/4$

c) $1/3$

d) $1/5$

2. $\operatorname{ctg}(\frac{\pi}{4} - i \cdot \ln 2)$ sonining mavhum qismini toping.

a) $15/17$

b) 0

c) -1

d) $12/15$

3. $\cos(2 + i)$ sonining haqiqiy qismini toping.

a) $\operatorname{ch} 1 \cdot \cos 2$

b) $\cos 2 \cdot \sin 1$

c) $\sin 2 \cdot \sin 1$

d) $\operatorname{sh} 1 \cdot \cos 2$

4. $\operatorname{ctg}(\frac{\pi}{4} - i \cdot \ln 2)$ sonining mavhum qismini toping.

a) 0

b) $15/17$

c) -1

d) $12/15$

5. $\cos(2 + i)$ sonining haqiqiy qismini toping.

a) $\sin 2 \cdot \sin 1$

b) $\cos 2 \cdot \sin 1$

c) $\operatorname{ch} 1 \cdot \cos 2$

d) $\operatorname{sh} 1 \cdot \cos 2$

6. Parallelogrammning uchta uchlari berilgan: $z_1 = 1 + i$, $z_2 = 2 + 1,5 \cdot i$, $z_3 = 3 + 3 \cdot i$. z_2 uchiga qarama-qarshi yotuvchi to'rtinchi z_4 uchini toping.

a) $z_4 = 1,5 + 2,5 \cdot i$

b) $z_4 = 1,5 + 2 \cdot i$

c) $z_4 = 2 + 2,5 \cdot i$

d) $z_4 = 2 + 2 \cdot i$

7. Parallelogrammning uchta uchlari berilgan: $z_1 = 1 + i$, $z_2 = 2 +$

$1,5 \cdot i, z^3 = 3 + 3 \cdot i \cdot z^2$ uchiga qarama-qarshi yotuvchi to'rtinchi z^4 uchini toping.

- a) $z^4 = 2 + 2 \cdot i$
- b) $z^4 = 1,5 + 2 \cdot i$
- c) $z^4 = 1,5 + 2,5 \cdot i$
- d) $z^4 = 2 + 2,5 \cdot i$

8. $z = (1 + i)^8 \cdot (1 - i\sqrt{3}) - 6$ uchun $|z|$?

- a) $\frac{1}{4}$
- b) $\frac{\sqrt{3}}{2}$
- c) π
- d) $\frac{\pi}{6}$

9. $z = (1 + i)^8 \cdot (1 - i\sqrt{3}) - 6$ uchun $\arg z$?

- a) π
- b) 1
- c) $1/2$
- d) $\frac{\pi}{6}$

10. $\operatorname{Im} f(z) = y \cdot \cos y \cdot \operatorname{ch} x + x \cdot \sin y \cdot \operatorname{sh} x, \quad f(0) = 0$ bo'lsin. U holda $f(z)$ holomorf funksiyani toping:

- a) $\sin z \cdot \operatorname{ch} z$
- b) $i \cdot z \cdot \cos z$
- c) $z \cdot \operatorname{ch} z$
- d) $\cos z \cdot \operatorname{sh} z$

11. $\operatorname{Re} f(z) = x \cdot \cos x \cdot \operatorname{ch} y + y \cdot \sin x \cdot \operatorname{sh} y, \quad f(0) = 0$ bo'lsin. U holda $f(z)$ holomorf funksiyani toping:

- a) $z \cdot \cos z$
- b) $z \cdot \sin z$

c) $z \cdot chz$

d) $z \cdot shz$

12. $f(z) = ex(x \cdot cosy - y \cdot siny)$, $f(0) = 0$ bo'lsin. U holda $f(z)$ golomorf funksiyaning toping:

a) $z \cdot ez$

b) $ezsinz$

c) $zcoszez$

d) $z + ez$

13. $Ref(z) = x^3 + 6x^2y - 3xy^2 - 2y^3$, $f(0) = 0$ bo'lsin. U holda $f(z)$ golomorf funksiyaning toping:

a) $2iz^3$

b) $(1 - 2i)z^3$

c) $3(z - 1)^3$

d) $2z^3 - 3$

14. $\frac{xdx}{x^4 + 1}$ integralni hisoblang.

a) $arctg \frac{x}{4} + C$

b) $\frac{1}{2} arctgx^2 + C$

c) $arctg 4x + C$

d) $\frac{1}{2} arctg^2 x + C$

15. Ushbu $y = x^3 + 3x^2 - 9x + 0$ Funksiyaning kamayish oralig'ini toping.

a) $[3; -1]$

b) $[- ; -3]$

c) $[-3; 1]$

d) $[1; +]$

16. Ushbu funksiyaning hosilasini toping: $f(x) = (2x - x^3)^{10}$

a) $10(2x - x^3)(2 - 3x^2)$

b) $9(2x - x^3)^9$

c) $10(2x - x^3)^9$

d) $10(2x - x^3)^9(2 - 3x^2)$

17. Quyidagi limitni hisoblang: $\lim_{x \rightarrow 0} \frac{\operatorname{tg} x - x}{x - \sin x}$

a) 3

b) 2

c) 2

d) 0,5

18. Agar $f(x) = \frac{1}{3}x^3 - 16x$ bo'lsa, $f(4)$ ni toping.

a) 5

b) 4

c) 3

d) 0

19. $y\left(\frac{\pi}{10}\right)$ ni toping. $y = \sqrt[3]{\sin^2 5x}$

a) 3

b) 2

c) 0

d) 9

20. $y = \frac{x}{2} - \sqrt{x}$ funksiyaning $[0;16]$ kesmadagi eng katta qiymatini hisoblang.

a) 6

b) 5

c) 2

d) 4

21. Ushbu funksiyaning hosilasini toping: $f(x)=\sin(2/x)$

- a) $-(2/x^2) \cos(2/x)$
- b) $(2/x^2) \cos(2/x)$
- c) $-(2/x^2) \sin(2/x)$
- d) $-(2/x) \cos(2/x^2)$

22. $\frac{dx}{x(x^2+1)}$ ni toping.

- a) $\ln|x|+\arctg x+C$
- b) $\ln(x^2+1)+C$
- c) $\ln \frac{|x|}{\sqrt{x^2+1}} + C$
- d) $(\ln|x(x^2+1)|)+C$

23. $\frac{x^3+2x+2\sqrt{x}}{x\sqrt{x}}dx$ ni hisoblang.

- a) $\frac{4}{5}x^2\sqrt{x}+4\sqrt{x}+\ln|x|+C$
- b) $\frac{2}{5}x^2\sqrt{x}+4\sqrt{x}+\ln|x|+C$
- c) $\frac{2}{5}x^2\sqrt{x}+4\sqrt{x}+2\ln|x|$
- d) $\frac{2}{5}x^2\sqrt{x}+4\sqrt{x}+2\ln|x|+C$

24. Funksiyaning hosilasini toping: $f(x)=2^{\sqrt{x}}$

- a) $\frac{2^{\sqrt{x}}}{2\sqrt{x}}$
- b) $\sqrt{x} 2^{\sqrt{x}-1}$

$$c) \frac{2^{\sqrt{x}} \ln 2}{2\sqrt{x}}$$

$$d) 2^{\sqrt{x}} \ln 2$$

25. $f(x) = \frac{1}{3}x^3 - \frac{3}{2}x^2 + 2x - 1$ funksiyaning maksimumini toping.

$$a) f_{\max}(1) = -\frac{1}{6}$$

$$b) f_{\max}(0) = -1$$

$$c) f_{\max}(2) = -\frac{1}{3}$$

d) maksimumi yo'q

26. $f(x) = \frac{1}{3}x^3 - \frac{3}{2}x^2 + 2x - 1$ funksiyaning minimumini toping.

$$a) f_{\min}(1) = -\frac{1}{6}$$

$$b) f_{\min}(0) = -1$$

$$c) f_{\min}(2) = -\frac{1}{3}$$

d) minimum yo'q

27. $\begin{pmatrix} \bar{a} \\ \bar{b} \end{pmatrix} = 42$ bo'lgan holda, $\bar{a} = \{4; 2; -1\}$, vektorga kollinear $\bar{b}$ vektorni toping.

$$a) \bar{b} = \{2; 1; -1\}$$

$$b) \bar{b} = \{-4; -2; 1\}$$

$$c) \bar{b} = \{2; 4; -1\}$$

$$d) \bar{b} = \{8; 4; -2\}$$

28. $\bar{a} = \{-2; -1; 1\}$, $\bar{b} = \{4; -4; 1\}$, $\bar{c} = \{4; -6; 2\}$ vektorlarning aralash ko'paytmasini toping

$$a) 0$$

$$b) 4$$

c) 6

d) 12

29. $\vec{a} = \{-1; 3; 4\}$, $\vec{b} = \{2; 5; 2\}$, $\vec{c} = \{1; 2; 3\}$ vektorlarga yasalgan parallelipepedning hajmini toping.

a) 54

b) -27

c) 27

d) 13,5

30. Parallelogramm uchta uchining koordinatalari berilgan; $A(-2; 3)$, $B(4; -5)$, $C(-3; 1)$ parallelogrammning yuzi nimaga teng.

a) 20

b) 22

c) 16

d) 49

31. $\vec{a} = \{2; -3; -1\}$ vektor oxirining koordinatalari $(1; -1; 2)$ nuqtada bo'lsa, boshining koordinatalarini toping.

a) $(-1; 3; 2)$

b) $(-1; 2; 3)$

c) $(0; -1; 2)$

d) $(3; 2; -1)$

32. To'g'ri chiziqning umumiy tenglamasi $Ax + By + C = 0$ da x va y o'zgaruvchilar oldidagi koeffitsientlar qanday geometrik ma'noga ega.

a) To'g'ri chiziqning Ox va Oy o'qlaridan ajratgan kesmalarining uzunliklari

b) To'g'ri chiziq yo'naltiruvchi vektorining koordinatlari

c) Ixtiyoriy koordinatlar

d) To'g'ri chiziq normal vektorining koordinatlari

33. $Ax + By = 0$, $A \neq 0$, $B \neq 0$ tenglama bilan berilgan to'g'ri chiziq tekislikda koordinata sistemasiga nisbatan qanday joylashgan.

- a) to'g'ri chiziq Oy o'qiga parallel
- b) to'g'ri chiziq Ox o'qiga parallel
- c) to'g'ri chiziq Ox o'qi bilan ustma-ust tushadi
- d) to'g'ri chiziq koordinata boshidan o'tadi

34. $Ax + B = 0, B \neq 0$ tenglama bilan berilgan to'g'ri chiziq tekislikda koordinata sistemasiga nisbatan qanday joylashgan.

- a) to'g'ri chiziq Oy o'qiga parallel
- b) to'g'ri chiziq koordinata boshidan o'tadi
- c) to'g'ri chiziq Ox o'qi bilan usma-ust tushadi
- d) to'g'ri chiziq Oy o'qi bilan usma-ust tushadi

35. $\frac{x}{a} + \frac{y}{b} = 1$ tenglama to'g'ri chiziqning qanday ko'rinishdagi tenglamasi

deyiladi ?

- a) To'g'ri chiziqning umumiy tenglamasi
- b) To'g'ri chiziqning kesmalarga nisbatan tenglamasi
- c) Kanonik ko'rinishdagi tenglamasi

1. $w = f(z)$ funksiya $|z - 2| < 1$ doirani $|w - 2i| < 2$ birlik doiraga

$f(2) = i$, $\arg f'(2) = 0$ shartlari bilan konform akslantirsin. U holda

$f(3/2) =$

- a) i
- b) $(5i + 1)/2$
- c) $(-13 + 16i)/15$
- d) $(-12 + 14i)/17$

2. $w = f(z)$ funksiya $|z| < 1$ doirani $|w - 1| < 1$ birlik doiraga $f(0) = 1/2$,

$f(1) = 0$ shartlari bilan konform akslantirsin. U holda $f(1/2) =$

- a) $1/6$
- b) $1/4$
- c) $1/3$
- d) $1/5$

3. $w = f(z)$ funksiya $|z| < 1$ doirani $|w| < 1$ birlik doiraga $f(0) = 0$, $\arg f'(0) = -\pi/2$ shartlari bilan konform akslantirsin. U holda $f(1/2) =$

- a) $-i/2$
- b) $i/2$
- c) $1/2$
- d) $-1/3$

4. $w = f(z)$ funksiya $|z| < 1$ doirani $|w| < 1$ birlik doiraga $f(1/2) = 0$, $\arg f'(1/2) = \pi/2$ shartlari bilan konform akslantirsin. U holda $f(0) =$

- a) $1/2$
- b) $-1/2$
- c) $i/2 - 1/3$
- d) $1/4$

5. $w = f(z)$ funksiya $|z| < 1$ doirani $|w| < 1$ birlik doiraga $f(1/2) = 0$, $\arg f'(1/2) = \pi/2$ shartlari bilan konform akslantirsin. U holda $f(0) =$

- a) $i/2$
- b) $1/2$
- c) $-1/2$
- d) $1/4$

6. $w = f(z)$ funksiya $|z| < 2$ $\operatorname{Re} w > 0$ doiraga o'ngyarimtekislikni $f(0) = 1$, $\arg f'(0) = \frac{\pi}{2}$ shartlari bilan konform akslantirsin. U holda $f(i) =$

- a) $1/3$
- b) $1/4$
- c) **$1/5$**
- d) $1/6$

7. $\frac{dx}{2x+1}$ integralni hisoblang.

a) $\frac{1}{(2x+1)^2} + C$

b) $\frac{1}{2} \ln|2x+1| + C$

c) $\sqrt{x} + C$

d) $\ln|x| + C$

8. $(2x-1)^{10} dx$ integralni hisoblang.

a) $\frac{1}{11}(2x-1)^{11} + C$

b) $\frac{1}{22}(2x+1)^{11} + C$

c) $\frac{1}{22}(2x-1)^{11} + C$

d) $\frac{1}{11}(2x+1)^{11} + C$

9. $ctgx \, dx$ integralni hisoblang.

a) tgx

b) $ctg^2 x + C$

c) $\ln|x| + C$

d) $\ln|\sin x| + C$

10. $\cos^2 x \, dx$ integralni hisoblang.

a) $x + \frac{1}{4} \sin 2x + C$

b) $\frac{1}{2} x + \sin 2x + C$

c) $\frac{1}{2} x + \frac{1}{4} \sin 2x + C$

d) $x + \sin 2x + C$

11. $\sin^2 x \, dx$ integralni hisoblang.

- a) $x + \frac{1}{4} \cos 2x + C$
- b) $\frac{1}{2}x - \frac{1}{4} \sin 2x + C$
- c) $x + \sin 2x + C$
- d) $x + \cos 2x + C$

12. $f(x) = x \sin x$ funksiyaning hosilasini toping.

- a) $\sin x + x \cos x$
- b) $\sin x$
- c) $x \cos x$
- d) $\cos x$

13. Ko'rsatilgan tartibdagi differensialni toping: $y = x^5$, $d^5 y = ?$

- a) $d^5 y = 24 dx^5$
- b) $d^5 y = 150 dx^5$
- c) $d^5 y = 5 dx^5$
- d) $d^5 y = 120 dx^5$

14. Funksiya grafigiga x_0 nuqtada o'tkazilgan urinma tenglamasi qaysi javobda to'g'ri berilgan.

- a) $y = f(x_0) + f'(x_0)(x - x_0)$
- b) $y = f(x_0) - \frac{1}{f'(x_0)}(x - x_0)$
- c) $y = f(x_0) + f'(x_0)(x + x_0)$
- d) $y = f(x_0) + \frac{1}{f'(x_0)}(x - x_0)$

15. Funksiya grafigiga x_0 nuqtada o'tkazilgan normal tenglamasi qaysi javobda to'g'ri berilgan.

- a) $y = f(x_0) - \frac{1}{f'(x_0)}(x - x_0)$

$$b) y=f(x_0)+\frac{1}{f'(x_0)}(x-x_0)$$

$$c) y=f(x_0)+f''(x_0)(x-x_0)$$

$$d) y=f(x_0)+f''(x_0)(x-x_0)$$

16. Funksiya hosilasini 0-ga aylantiradigan nuqta qanday nuqta deyiladi?

a) minimum nuqta

b) maksimum nuqta

c) ekstremum nuqta

d) statsionar nuqta

17. Teskari funksiyaning hosilasi qaysi javobda to'g'ri berilgan?

$$a) [f^{-1}(y)]_{x_0} = -\frac{1}{f'(x_0)}$$

$$b) [f^{-1}(y)]_{x_0} = \frac{1}{f'(x_0)}$$

$$c) [f^{-1}(y)]_{x_0} = \frac{1}{f(x_0)}$$

$$d) [f^{-1}(y)]_{x_0} = -\frac{1}{f(x_0)}$$

18. $\ln 1 + \frac{1}{n}$ qatorning xususiy yig'indisini toping.

$$a) \ln n - 1$$

$$b) \ln(n+1) - \ln 2$$

$$c) \ln(n+1)$$

$$d) -\ln(n+1)$$

19. Davri 2π ga teng bo'lgan $f(x) = \begin{cases} 1, & 0 < x < \pi \\ 0, & -\pi < x < 0 \end{cases}$ funksiya uchun a_0 Furye

koeffitsientini toping.

$$a) 0,5$$

$$b) 1$$

$$c) -0,5$$

d) 2

20. $\frac{x-x_1}{x_2-x_1} = \frac{y-y_1}{y_2-y_1}$ ko'rinishdagi tenglama qanday ataladi?

- a) To'g'ri chiziqning parametrik tenglamasi
- b) To'g'ri chiziqning kesmalarga nisbatan tenglamasi
- c) To'g'ri chiziqning kanonik tenglamasi
- d) Berilgan ikki nuqtadan o'tuvchi to'g'ri chiziq tenglamasi

21. To'g'ri chiziqning parametrik tenglamalari ... ko'rinishga ega

a)
$$\begin{aligned} x &= x_1 + \lambda m \\ y &= y_1 + \lambda n \end{aligned}$$

b)
$$\frac{x-x_1}{x_2-x_1} = \frac{y-y_1}{y_2-y_1}$$

c)
$$\frac{x}{a} + \frac{y}{b} = 1$$

d)
$$y = kx + b$$

22. $y = kx + b$ ko'rinishdagi tenglama to'g'ri chiziqning qanday ko'rinishdagi tenglamasi va k, b sonlar qanday geometrik ma'noga ega?

- a) To'g'ri chiziqning parametrik tenglamasi, $k = \operatorname{ctg} \varphi$, b to'g'ri chiziqning Oy o'qidan ajratgan kesmasining uzunligi
- b) To'g'ri chiziqning burchak koeffitsientli tenglamasi, k son to'g'ri chiziqning Ox o'qi bilan tashkil kilgan burchak kotangensiga teng, b son to'g'ri chiziqning Ox o'qidan ajratgan kesmasi
- c) To'g'ri chiziqning burchak koeffitsientli tenglamasi, $k = \operatorname{Cos} \varphi$, b ixtiyoriy son
- d) To'g'ri chiziqning burchak koeffitsientli tenglamasi, k son to'g'ri chiziqning Ox o'qi bilan tashkil kilgan burchak tangensiga teng, b son to'g'ri chiziqning Oy o'qidan ajratgan kesmasi

23. $A_1x + B_1y + C_1 = 0$ va $A_2x + B_2y + C_2 = 0$ to'g'ri chiziqlar orasidagi burchakni qanday formula yordamida topiladi?

$$\text{a) } \cos \phi = \frac{A_1 A_2 + B_1 B_2}{\sqrt{A_1^2 + B_1^2} \sqrt{A_2^2 + B_2^2}}$$

$$\text{b) } \sin \phi = \frac{A_1 A_2 + B_1 B_2}{\sqrt{A_1^2 + B_1^2} \sqrt{A_2^2 + B_2^2}}$$

$$\text{c) } \cos \phi = \frac{A_1 B_2 + A_2 B_1}{\sqrt{A_1^2 + A_2^2} + \sqrt{B_1^2 + B_2^2}}$$

$$\text{d) } \operatorname{tg} \phi = \frac{k_2 + k_1}{1 + k_1 k_2}$$

24. $A_1 x + B_1 y + C_1 = 0$ va $A_2 x + B_2 y + C_2 = 0$ to'g'ri chiziqlarning perpendikulyarlik shartlari quyidagicha:

$$\text{a) } \frac{A_1}{B_2} = \frac{A_2}{B_1}$$

$$\text{b) } A_1 A_2 + B_1 B_2 = 0$$

$$\text{c) } \frac{A_1}{B_2} = \frac{A_2}{B_1}, \quad A_1 A_2 + B_1 B_2 = 0$$

$$\text{d) } \frac{A_1}{A_2} = \frac{A_1}{B_1}, \quad A_1 A_2 + B_1 B_2 = 0$$

25. $\frac{x-x_1}{m_1} = \frac{y-y_1}{n_1}$ va $\frac{x-x_2}{m_2} = \frac{y-y_2}{n_2}$ tenglamalar bilan berilgan to'g'ri chiziqlar

orasidagi burchak qanday formula yordamida aniqlanadi?

$$\text{a) } \cos \phi = \frac{m_1 m_2 + n_1 n_2}{\sqrt{m_1^2 + n_1^2} \sqrt{m_2^2 + n_2^2}}$$

$$\text{b) } \sin \phi = \frac{m_1 m_2 + n_1 n_2}{\sqrt{m_1^2 + n_1^2} \sqrt{m_2^2 + n_2^2}}$$

$$\text{c) } \cos \phi = \frac{m_1 m_2 + n_1 n_2}{\sqrt{m_1^2 + n_1^2} + \sqrt{m_2^2 + n_2^2}}$$

$$\text{d) } \cos \phi = \frac{m_1 m_2 + n_1 n_2}{\sqrt{m_1^2 + n_1^2} \sqrt{m_2^2 + n_2^2}}$$

26. $\frac{x-x_1}{l_1} = \frac{y-y_1}{m_1}$ va $\frac{x-x_2}{l_2} = \frac{y-y_2}{m_2}$ ko'rinishdagi tenglamalar bilan berilgan

to'g'ri chiziqlarning perpendikulyarlik shartlarini ko'rsating.

a) $l_1 l_2 - m_1 m_2 = 0$

b) $\frac{l_1}{l_2} = -\frac{m_1}{m_2}, \quad l_1 m_2 + l_2 m_1 = 0$

c) $\frac{l_1}{m_2} = \frac{l_2}{m_1}, \quad l_1 m_1 - l_2 m_2 = 0$

d) $l_1 l_2 + m_1 m_2 = 0$

27. $y = k_1 x + b_1$ va $y = k_2 x + b_2$ ko'rinishdagi tenglamalar parallel bo'lsa, bu to'g'ri chiziqlar orasidagi burchak qanday formula yordamida aniqlanadi?

a) $\operatorname{tg} \varphi = \frac{k_2 + k_1}{1 + k_1 k_2}$

b) $\operatorname{tg} \varphi = \frac{k_2 - k_1}{1 - k_1 k_2}$

c) 0 ga teng deb olinadi

d) $\operatorname{tg} \varphi = \frac{1 - k_2 k_1}{k_1 + k_2}$

28. $y = k_1 x + b_1$ va $y = k_2 x + b_2$ tenglamalari bilan berilgan ikki to'g'ri chiziqning parallellik shartlarini ko'rsating.

a) $k_1 + k_2 = 0$

b) $k_1 = -k_2, \quad \frac{k_1}{k_2} = 1$

c) $-k_1 = k_2, \quad k_1 = \frac{1}{k_2}$

d) $k_1 = k_2$

29. $x \cos \alpha + y \sin \alpha - p = 0$ tenglama to'g'ri chiziqning tenglamasida p - sonning geometrik ma'nosi qanday?

a) p - koordinata boshidan to'g'ri chiziqqacha masofaning ikkilangani

b) p - koordinata boshidan to'g'ri chiziqqacha masofa

c) p - koordinata boshidan to'g'ri chiziqqacha masofaning yarmi

d) p - ixtiyoriy son

30. $M_1(x_1, y_1)$ nuqtadan $x \cos \phi + y \sin \phi - p = 0$ to'g'ri chiziqlik bo'lgan masofa

$x_1 \cos \phi + y_1 \sin \phi - p = 0$ bo'lganda qanday formula orqali hisoblanadi?

a) $d = x_1 \cos \phi - y_1 \sin \phi - p$

b) $d = |x_1 \cos \phi + y_1 \sin \phi - p|$

c) $d = \frac{\sqrt{A^2 + B^2}}{|Ax_1 + By_1 - C|}$

d) 0 ga teng bo'ladi

31. $M_1(x_1, y_1)$ nuqtadan $Ax + By + C = 0$ to'g'ri chiziqlik bo'lgan masofa

$Ax_1 + By_1 + C = 0$ bo'lganda qanday formula yordamida hisoblanadi?

a) 0 ga teng bo'ladi

b) $d = \frac{|Ax_1 + By_1 + C|}{\sqrt{A^2 + B^2}}$

c) $d = \frac{\sqrt{A^2 + B^2}}{|Ax_1 + By_1 + C|}$

d) $d = |x_1 \cos \alpha + y_1 \sin \alpha - p|$

32. $Ax + By + C = 0$ to'g'ri chiziqlik tenglamasi qanday shartda normal ko'rinishda bo'ladi?

a) $A^2 + B^2 = 1, C = 0$

b) $A^2 + B^2 = 1$

c) $A + B = 1, C = 0$

d) $A^2 + B^2 = 1, C = 0$

33. Ushbu $A_1x + B_1y + C_1 = 0$ va $A_2x + B_2y + C_2 = 0$ to'g'ri chiziqlarning bir nuqtada kesishish shartini ko'rsating

a) $\begin{vmatrix} A_1 & B_1 \\ A_2 & B_2 \end{vmatrix} = 0$

b) $\begin{vmatrix} A_1 & C_1 \\ A_2 & C_2 \end{vmatrix} = 0$

$$c) \begin{vmatrix} B_1 & C_1 \\ B_2 & C_2 \end{vmatrix} = 0$$

$$d) \begin{vmatrix} A_1 & B_1 \\ A_2 & B_2 \end{vmatrix} = 0$$

34. Ushbu $Ax + By + Cz + D = 0$ tekislikning umumiy tenglamasida A, B, C

koeffitsientlar qanday geometrik ma'noga ega?

- a) Tekislikda joylashgan vektorning koordinatlari
- b) Tekislik yo'naltiruvchi vektorining koordinatlari
- c) Tekislikning normal vektorining koordinatlari
- d) Tekislikka parallel vektorning koordinatlari

35. Ellipsoidning kanonik tenglamasini ko'rsating

$$a) \frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$

$$b) \frac{x^2}{a^2} - \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$

$$c) \frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 0$$

1. $\operatorname{Im} z = 0$ nuqtalarning geometrik o'rnini toping.

- e) $\{x = 0\}$ – yarim tekislik.
- f) $\{y = 0\}$ yarim tekislik.
- g) $\{y = 0\}$ – yarim tekislik
- h) $\{x = 0\}$ yarim tekislik.

2. $1 < |z - 1| < 3$ nuqtalarning geometrik o'rnini toping.

- e) Markazi $z = 1$ nuqtada radiusi 2 bo'lgan doira.
- f) Markazi $z = 1$ nuqtada radiusi 3 bo'lgan doira.
- g) Markazi $z = 1$ nuqtada radiusi 3 bo'lgan ochiq doira.
- h) Markazlari $z = 1$ nuqtada radiuslari 1 va 3 bo'lgan xalqa

3. $z = 1 - it$ ($0 \leq t \leq 2$) funksiya aniqlagan egri chiziqni toping.

$$e) \{x = -1, -2 \leq y \leq 0\}$$

f) $\{x=1.0 \quad y=2\}$

g) $\{x=1: -2 \leq y \leq 0\}$

h) $\{x=-1.0 \leq y \leq 2\}$

4. $\lim_{n \rightarrow \infty} \frac{a^n}{1+a^{2n}} + 1$ ni hisoblang.

e) 2

f) 0

g) 1

h) $1\frac{1}{2}$

5. Kompleks tekislikning birinchi kvadratini tengsizlik yordamida yozing.

e) $\{\operatorname{Re} z \geq 0: \operatorname{Im} z < 0\}$

f) $\{\operatorname{Re} z > 0 \operatorname{Im} z > 0\}$

g) $\{\operatorname{Re} z < 0 \operatorname{Im} z > 0\}$

h) $\{\operatorname{Re} z < 0: \operatorname{Im} z < 0\}$

6. $z = R e^{it} \quad 0 \leq t \leq \frac{\pi}{2} \quad R > 0$ funksiya aniqlagan egri chiziqni toping.

e) $\{|z| = R\}, \operatorname{Re} z \geq 0, \operatorname{Im} z \geq 0$

f) $\{|z| = R\}$ aylana.

g) $\{|z| = R \operatorname{Re} z \geq 0\}$ aylana.

h) $\{|z| = R \operatorname{Im} z \geq 0\}$ aylana.

7. Amallarni bajaring. $(1+i)^{10}$

e) 32

f) $32i$

g) $\frac{\pi}{2}$

h) $-32i$

8. $z = \frac{1-i}{1+i}$ sonning argumentini toping.

e) $\arg z = \frac{2\pi}{3}$

f) $\arg z = \frac{3\pi}{2}$

g) $\arg z = \frac{3\pi}{4}$

h) $\arg z = \frac{\pi}{3}$

9. $z = -1 + i\sqrt{3}$ sonni trigonometrik shaklda tasvirlang.

e) $z = \cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3}$

f) $z = -2 \cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3}$

g) $z = 2(\cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3})$

h) $z = 2 \sin \frac{2\pi}{3} + i \cos \frac{2\pi}{3}$

10. $\lim_{n \rightarrow \infty} \frac{n}{2n+1} = \frac{1}{2}$. Agar $\varepsilon = 0,001$ bo'lsa, $\left| \frac{n}{2n+1} - \frac{1}{2} \right| < \varepsilon$ tengsizlik o'rinli

bo'ladigan $n \in \mathbb{N}$ ning eng kichik qiymatini toping.

e) 249

f) 248

g) 150

h) 250

11. Quyidagi jumlaning qaysi biri to'g'ri?

e) Quyidan chegaralangan ixtiyoriy X sonli to'plam eng kichik elementga ega

f) Chegaralangan X sonli to'plam aniq yuqori va aniq quyi chegaraga ega

g) Quyidan chegaralangan ixtiyoriy X sonli to'plam eng katta elementga ega

h) Chegaralangan ixtiyoriy X sonli to'plam eng katta va eng kichik elementga ega

12. Quyidagi jummalarning qaysi biri to'g'ri?

- e) agar $x_n \leq y_n$ ($n=1,2,\dots$) bo'lib, $\lim_{n \rightarrow \infty} x_n$ chekli bo'lsa, u holda $\lim_{n \rightarrow \infty} y_n$ ham chekli bo'ladi.
- f) agar x_n ketma-ketlik o'suvchi, y_n ketma-ketlik kamayuvchi, $x_n \leq y_n$ ($n=1,2,\dots$) bo'lib, $\lim_{n \rightarrow \infty} (y_n - x_n) = 0$ bo'lsa, u holda $\lim_{n \rightarrow \infty} x_n = \lim_{n \rightarrow \infty} y_n$ bo'ladi.
- g) agar $x_n \leq y_n$ ($n=1,2,\dots$) bo'lib, $\lim_{n \rightarrow \infty} y_n$ chekli bo'lsa, u holda $\lim_{n \rightarrow \infty} x_n$ ham chekli bo'ladi.
- h) agar $x_n \leq y_n$ ($n=1,2,\dots$) bo'lsa, u holda har doim $\lim_{n \rightarrow \infty} x_n = \lim_{n \rightarrow \infty} y_n$ bo'ladi.

13. $\lim_{n \rightarrow \infty} a_n = a$ degani bu

- e) a nuqtaning shunday atrofi topilib, bu atrofga $\{a_n\}$ ketma-ketlikning faqat chekli sondagi hadlari tegishli
- f) a nuqtaning ixtiyoriy atrofida $\{a_n\}$ ketma-ketlikning hadlari mavjud emas
- g) a nuqtaning ixtiyoriy atrofida $\{a_n\}$ ketma-ketlikning faqat chekli sondagi hadlari mavjud
- h) a nuqtaning shunday atrofi topilib, bu atrofga tegishli bo'lmagan $\{a_n\}$ ketma-ketlikning cheksiz ko'p hadlari mavjud

14. Quyidagi limitlarni toping. $\lim_{n \rightarrow \infty} \frac{\sqrt{n^2 + 1}}{3n + 1}$ va $\lim_{n \rightarrow \infty} \frac{1 - 3n}{\sqrt{n^4 + 1}}$

- e) $1/3$ va -3
- f) 1 va 0
- g) $1/3$ va 0
- h) 3 va 0

15. Quyidagi formulalarning qaysi biri xato?

- e) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$
- f) $\lim_{x \rightarrow 0} (1 + x)^{\frac{1}{x}} = e$

g) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 0$

h) $\lim_{n \rightarrow \infty} 1 + \frac{1}{n} = e$

16. Shartga mos to'g'ri xulosani ko'rsating: Agar $\lim_{x \rightarrow a} f(x) = b < 0$ bo'lsa,

- e) a nuqtaning shunday atrofi mavjud bo'lib, bunda funksiyaning qiymatlari b dan kichik bo'ladi.
- f) a nuqtaning ixtiyoriy atrofida funksiya manfiy qiymatlarni qabul qiladi.
- g) a nuqtaning shunday atrofi mavjud bo'lib, bunda funksiya manfiy qiymatlar qabul qiladi.
- h) a nuqtaning ixtiyoriy atrofida $f(x) < b$ bo'ladi.

17. Quyidagi ketma-ketliklarning qaysilari uzoqlashuvchi? 1) $x_n = n^3$, 2)

$x_n = \frac{n+1}{n}$, 3) $x_n = \frac{n^2+1}{n+1}$

- e) 1, 2
- f) 1, 3
- g) 2, 3
- h) 1, 2, 3

18. Quyidagi mulohazalardan qaysi biri noto'g'ri?

- e) Chegaralanmagan ketma-ketlik cheksiz katta ketma-ketlikdir
- f) Cheksiz katta ketma-ketlik chegaralanmagan ketma-ketlikdir
- g) Agar $\{x_n\}$ cheksiz katta ketma-ketlik bo'lsa, $\{1/x_n\}$ chegaralangan ketma-ketlik bo'ladi
- h) Agar $\{x_n\}$ cheksiz katta ketma-ketlik bo'lsa, $\{1/x_n\}$ cheksiz kichik ketma-ketlik bo'ladi

$-x - 3$, agar $x < -1$ bo'lsa,

19. Funksiyaning uzilish nuqtalarini toping. $y = 0$, agar $-1 < x < 0$ bo'lsa,

$\sqrt{x}$, agar $x \geq 0$ bo'lsa

e) $x=0$

f) $x=-1$

g) $x=-1, x=0$

h) $x=-3$

20. $Ax + By + C = 0$ ko'rinishdagi tenglama qanday ataladi?

e) To'g'ri chiziqning burchak koeffitsientli tenglamasi

f) To'g'ri chiziqning normal tenglamasi

g) Tekislikda to'g'ri chiziqning umumiy tenglamasi

h) To'g'ri chiziqning kesmalar bo'yicha tenglamasi

21. To'g'ri chiziqning umumiy tenglamasi $Ax + By + C = 0$ da x va y

o'zgaruvchilar oldidagi koeffitsientlar qanday geometrik ma'noga ega.

e) To'g'ri chiziq normal vektorining koordinatalari

f) To'g'ri chiziq yo'naltiruvchi vektorining koordinatalari

g) To'g'ri chiziqning Ox va Oy o'qlaridan ajratgan kesmalarining uzunliklari

h) Ixtiyoriy koordinatalar

22. $Ax + By = 0, A \neq 0, B \neq 0$ tenglama bilan berilgan to'g'ri chiziq tekislikda

koordinata sistemasiga nisbatan qanday joylashgan.

e) to'g'ri chiziq Oy o'qiga parallel

f) to'g'ri chiziq koordinata boshidan o'tadi

g) to'g'ri chiziq Ox o'qiga parallel

h) to'g'ri chiziq Ox o'qi bilan ustma-ust tushadi

23. $Ax + B = 0, B \neq 0$ tenglama bilan berilgan to'g'ri chiziq tekislikda koordinata

sistemasiga nisbatan qanday joylashgan.

e) to'g'ri chiziq Oy o'qi bilan usma-ust tushadi

f) to'g'ri chiziq Ox o'qi bilan usma-ust tushadi

g) to'g'ri chiziq koordinata boshidan o'tadi

h) to'g'ri chiziq Oy o'qiga parallel

24. $\frac{x}{a} + \frac{y}{b} = 1$ tenglama to'g'ri chiziqning qanday ko'rinishdagi tenglamasi

deyiladi ?

- e) Kanonik ko'rinishdagi tenglamasi
- f) To'g'ri chiziqning umumiy tenglamasi
- g) To'g'ri chiziqning kesmalarga nisbatan tenglamasi
- h) Burchak koefitsientli tenglamasi

25. $\frac{x-x_1}{m} = \frac{y-y_1}{n}$ tenglama to'g'ri chiziqning qanday ko'rinishdagi tenglamasi

deyiladi, m, n sonlar qanday geometrik ma'noga ega.

- e) To'g'ri chiziqning kanonik tenglamasi, m va n yo'naltiruvchi vektorning koordinatalari
- f) To'g'ri chiziqning kanonik tenglamasi, m va n normal vektorining koordinatalari
- g) To'g'ri chiziqning parametrik tenglamasi, m va n – haqiqiy sonlar
- h) To'g'ri chiziqning burchak koefitsientli tenglamasi, m va n haqiqiy sonlar

26. $\frac{x-x_1}{x_2-x_1} = \frac{y-y_1}{y_2-y_1}$ ko'rinishdagi tenglama qanday ataladi?

- e) To'g'ri chiziqning kanonik tenglamasi
- f) Berilgan ikki nuqtadan o'tuvchi to'g'ri chiziq tenglamasi
- g) To'g'ri chiziqning kesmalarga nisbatan tenglamasi
- h) To'g'ri chiziqning parametrik tenglamasi

27. To'g'ri chiziqning parametrik tenglamalari ... ko'rinishga ega

e) $\frac{x-x_1}{x_2-x_1} = \frac{y-y_1}{y_2-y_1}$

f) $\frac{x}{a} + \frac{y}{b_1} = 1$

g) $y = kx + b$

h)
$$\begin{aligned} x &= x_0 + tm \\ y &= y_0 + tn \end{aligned}$$

28. $y = kx + b$ ko'rinishdagi tenglama to'g'ri chiziqning qanday ko'rinishdagi tenglamasi va k, b sonlar qanday geometrik ma'noga ega?

- e) To'g'ri chiziqning burchak koefitsientli tenglamasi, k son to'g'ri

chiziqning Ox o'qi bilan tashkil kilgan burchak kotangensiga teng, b son to'g'ri chiziqning Ox o'qidan ajratgan kesmasi

- f) To'g'ri chiziqning burchak koeffitsientli tenglamasi, k son to'g'ri chiziqning Ox o'qi bilan tashkil kilgan burchak tangensiga teng, b son to'g'ri chiziqning Oy o'qidan ajratgan kesmasi
- g) To'g'ri chiziqning burchak koeffisientli tenglamasi, $k = \cos \varphi$, b ixtiyoriy son
- h) To'g'ri chiziqning parametrik tenglamasi, $k = \operatorname{ctg} \varphi$, b to'g'ri chiziqning Oy o'qidan ajratgan kesmasining uzunligi

29. $z = \frac{1}{1-i} + \frac{1}{1-i}$ sonning haqiqiy va mavhum qismlarini toping.

- e) $\operatorname{Re} z = 1; \operatorname{Im} z = 0$
- f) $\operatorname{Re} z = e; \operatorname{Im} z = 0$
- g) $\operatorname{Re} z = 1; \operatorname{Im} z = 1$
- h) $\operatorname{Re} z = -1; \operatorname{Im} z = -2$

30. $z^2 = 3 - 4i$ tenglamani eching.

- e) $\emptyset$
- f) $z_{1,2} = \pm(2 + i)$
- g) $z_{1,2} = (2 - i)$
- h) $z_1 = 2 - i, z_2 = -2 + i$

31. $\sqrt{3+4i}$ ning barcha qiymatlarini toping.

- e) $2 + i$
- f) $\pm(2 + i)$
- g) $\pm(2 - i)$
- h) $\pm(i - 2)$

32. Haqiqiy o'qdan yuqorida va undan 2 birlik masofa uzoqlikda joylashgan yarim tekislik.

- e) $\{\operatorname{Im} z \geq 2\}$

f) $\{Rez \leq 2\}$

g) $\{Imz \leq 2\}$

h) $\{Rez \geq 2\}$

33. $|z| - z = 1 + 2i$ tenglamani eching.

e) $3 - 2i$

f) $z = \frac{3}{2} - 2i$

g) $\frac{1}{2} - 2i$

h) $\frac{3}{2} + 2i$

34. $\sqrt[4]{-1}$ ning barcha qiymatlarini toping.

e) $\pm \frac{\sqrt{2}}{2}(1 - i)$

f) $\pm \frac{\sqrt{2}}{2}(1 + i)$

g) $\pm \frac{\sqrt{2}}{2}(1 \pm i)$

h) $\emptyset$

35. $W = z^{-2}$ akslantirishning $z_0 = i$ nuqtadagi burilish burchagi $\alpha(\varphi)$ ni toping.

d) $\alpha(\varphi) = \varphi - \pi$

e) $\alpha(\varphi) = \frac{\pi}{2}$

f) $\alpha(\varphi) = \pi$

1. $W(0) = 0$, $W(1 + i) = 2 + 2i$, $W(2i) = 4$ shartlarni qanoatlantiruvchi $W(z)$ akslantirishni toping.

a) $W = \frac{2z}{z + i}$

b) $W = \frac{2z}{z - i}$

c) $W = \frac{2z - i}{z}$

d) $W = \frac{2z+i}{z-i}$

2. $W(0)=4$ $W(1+i)=2+2i$ $W(2i)=0$ shartlarni qanoatlantiruvchi $W(z)$ akslantirishni toping.

a) $W = 2iz + 4$

b) $W = 2iz - 4$

c) $W = 2iz + 2$

d) $W = 2iz - 2$

3. $W = z^2$ akslantirish yordamida tekislikning qaysi qismi cho`ziladi.

a) $|z| < \frac{1}{2}$

b) $|z| > \frac{1}{2}$

c) $|z| = \frac{1}{2}$

d) $\{ |z| = 1 \}$

4. $f(z) = |z|^2 [Rez]^2$ funksiyaning haqiqiy qismini toping.

a) $\{u(x, y) = (x^2 + y^2)x\}$

b) $\{u(x, y) = x^2 + y^2\}$

c) $\{u(x, y) = (x^2 + y^2)y\}$

d) $\{u(x, y) = (x^2 - y^2)x\}$

5. $W = z^2$ akslantirishning $z_0 = -\frac{1}{4}$ nuqtadagi cho`zilish koeffitsentini toping.

a) $R(\varphi) = \frac{1}{4}$

b) $R(\varphi) = 1$

c) $R(\varphi) = -\frac{1}{2}$

d) $R(\varphi) = \frac{1}{2}$

6. $W = z^{-2}$ akslantirishning $z_0 = i$ nuqtadagi cho'zilish koeffitsentini toping.

a) $R(\varphi) = \varphi - \frac{\pi}{2}$

b) $R(\varphi) = 1$

c) $R(\varphi) = \frac{\pi}{2}$

d) $R(\varphi) = 2$

7. Agar $w=f(z)$ funksiya z_0 nuqtada va uning biror atrofida xam differensiallanuvchi bo'lsa, u funksiya shu nuqtada.

a) regulyar

b) analitik

c) monogen

d) analitik va
regulyar

8. $w=f(z)$ funksiyaning analitik bo'ladigan nuqtalari uning qanday nuqtalari.

a) to'g'ri nuqtalari

b) regulyar nuqtalari

c) maxsus nuqtalari.

d) analitik va regulyar

9. Funksiya aniqlanish sohasining funksiyas analitik bo'lmaydigan nuqtalari uning qanday nuqtalari.

a) regulyar nuqtalari

b) to'g'ri nuqtalari

c) maxsus nuqtalari

d) analitik va regulyar

10. Hosila argumentining geometrik manosi nimadan iborat.

a) analitik va regulyar

b) $f'(z) \neq 0$ bo'lgan barcha nuqtalarida burchaklari saqlaydi.

c) $f'(z) \neq 0$ bo'lgan barcha nuqtalarida burchakni va cho'zilish koeffisientini saqlash xossasi.

d) $f'(z)$ hosila nolga teng bo'lgan hamma nuqtalarida o'zgarmas cho'zilishga ega.

11. Cho'zilish koeffisienti birdan katta bo'lsa, soha...

- a) o'zgarmay o'tadi.
- b) kengayib o'tadi
- c) qisqarib o'tadi.
- d) Qisqarmaydi ham kengaymaydi ham

12. Cho'zilish koeffisienti birdan kichik bo'lsa, soha...

- a) Qisqarmaydi ham kengaymaydi ham
- b) o'zgarmay o'tadi.
- c) kengayib o'tadi.
- d) qisqarib o'tadi.

13. Cho'zilish koeffisienti birga teng bo'lsa, soha

- a) o'zgarmay o'tadi.
- b) kengayib o'tadi
- c) qisqarib o'tadi.
- d) Qisqarmaydi ham kengaymaydi ham

14. Quyidagi qaysi funksiyalarning $\mathbb{R}$ da teskari funksiyasi mavjud?

1) $y=\sin x$; 2) $y=2x^2-1$; 3) $y=4x^3$; 4) $y=\arctg x$

- a) 1, 3 va 4
- b) 1 va 4
- c) 1 va 2
- d) 3 va 4

15. $f(x)=\begin{cases} x^2 - 2, & \text{agar } |x| \leq 1 \text{ bo'lsa,} \\ -\frac{1}{x^2}, & \text{agar } |x| > 1 \text{ bo'lsa} \end{cases}$ funksiyaning uzulish nuqtalari va ularning

turini aniqlang.

- a) $x=1$ va $x=-1$ I-tur uzilish nuqtalari, $x=0$ II- tur uzilish nuqtasi
- b) $x=1$ I-tur uzilish nuqtasi
- c) funksiya aniqlanish sohasida uzluksiz.

d) $x=1$ va $x=-1$ I-tur uzilish nuqtalari

16. $\{n^2 - 10n + 9, n \in \mathbb{N}\}$ to'plamning aniq quyi chegarasini toping.

a) -15

b) -34

c) -16

d) 0

17. $\{n^2 - 6n + 11, n \in \mathbb{N}\}$ to'plamning aniq quyi chegarasini toping.

a) 2

b) 6

c) 11

d) 0

18. Juft funksiyaning aniqqlang: 1) $f(x) = x^3 \sin x$, 2) $f(x) = x^2 \cos x$; 3)

$$f(x) = x + x^3$$

a) 2, 3

b) 1, 3

c) 1, 2, 3

d) 1, 2

19. Quyidagi jummalarni qaysi biri xato?

a) Ratsional sonlar to'plami $\mathbb{Q}$ zich to'plam

b) Ratsional sonlar to'plami $\mathbb{Q}$ tartiblangan to'plam

c) Ratsional sonlar to'plami $\mathbb{Q}$ yuqoridan chegaralangan

d) Ikkita ratsional sonlarni yig'indisi, ayirmasi, ko'paytmasi ratsional son bo'ladi

20. $y = \sqrt{x+6} - \sqrt{16-x}$ funksiyaning aniqlanish sohasini toping.

a) $[-6; 10]$

b) $[-6; 4]$

c) $[0; 6]$

d) $[-6; 16]$

21. Agar x va y haqiqiy sonlar bo'lsa, u holda quyidagi munosabatlardan qaysi biri haqiqiy son absolyut qiymatining xossasini ifodalamaydi?

a) $\|y|-|x\| \quad |x-y|$

b) $\|x|-|y\| \quad |x-y|$

c) $|x-y| < |x+y|$

d) $|x-y| \quad |x|+|y|$

22. Quyidagi funksiyalarning qaysi birlari o'zaro teskari funksiyalar 1) $y = 2x + 1$

2) $y = 2x - 1$ 3) $y = \frac{x-1}{2}$ 4) $y = x + 2$

a) 1, 2 va 3

b) 1 va 3

c) 1 va 2

d) 2 va 3

23. Quyidagi funksiyalarning qaysilari $(-; +)$ da o'suvchi? 1) $y = 2x - 1$

2) $y = x^2$ 3) $y = x^3$ 4) $y = x^4$

a) 1 va 3

b) 2 va 4

c) 1 va 2

d) 1, 2 va 3

24. Quyidagi jummalarning qaysi biri to'g'ri?

a) Toq funksiyaning grafigi ordinata o'g'iga nisbatan simmetrik

b) Toq funksiyaning grafigi abssissa o'g'iga nisbata simmetrik

c) Juft funksiyaning grafigi abssissa o'g'iga nisbatan simmetrik

d) Toq funksiyaning grafigi koordinata boshiga nisbatan simmetrik

25. $y = a^x$ – ko'rsatkichli funksiya uchun quyidagilarning qaysi biri xato?

a) quyidan chegaralangan

b) yuqoridan chegaralangan

c) $0 < a < 1$ bo'lganda kamayadi

d) $a > 1$ bo'lganda o'sadi

26. $y = \log_a x$ logarifmik funksiya uchun quyidagilarning qaysi biri xato?

a) Logarifmik funksiyaning grafigi abssissa o'g'ini kesadi

b) Logarifmik funksiyaning grafigi ordinata o'qini kesadi

c) $a > 1$ bo'lganda o'sadi

d) $0 < a < 1$ bo'lganda kamayadi

27. $A_1x + B_1y + C_1 = 0$ va $A_2x + B_2y + C_2 = 0$ to'g'ri chiziqlar orasidagi burchakni qanday formula yordamida topiladi?

a) $\cos \alpha = \frac{A_1A_2 + B_1B_2}{\sqrt{A_1^2 + B_1^2} \sqrt{A_2^2 + B_2^2}}$

b) $\sin \alpha = \frac{A_1A_2 + B_1B_2}{\sqrt{A_1^2 + B_1^2} \sqrt{A_2^2 + B_2^2}}$

c) $\cos \phi = \frac{A_1B_2 + A_2B_1}{\sqrt{A_1^2 + A_2^2} \sqrt{B_1^2 + B_2^2}}$

d) $\operatorname{tg} \phi = \frac{k_2 + k_1}{1 + k_1k_2}$

28. $A_1x + B_1y + C_1 = 0$ va $A_2x + B_2y + C_2 = 0$ to'g'ri chiziqlarning parallellik va perpendikulyarlik shartlari mos ravishda quyidagicha:

a) $\frac{A_1}{B_2} = \frac{A_2}{B_1}$, $A_1A_2 + B_1B_2 = 0$

b) $\frac{A_1}{B_2} = \frac{A_1}{B_2}$, $A_1A_2 + B_1B_2 = 0$

c) $\frac{A_1}{A_2} = \frac{B_1}{B_2}$, $A_1A_2 + B_1B_2 = 0$

d) $\frac{A_1}{A_2} = \frac{A_1}{B_1}$, $A_1A_2 + B_1B_2 = 0$

29. $\frac{x-x_1}{m_1} = \frac{y-y_1}{n_1}$ va $\frac{x-x_2}{m_2} = \frac{y-y_2}{n_2}$ tenglamalar bilan berilgan to'g'ri chiziqlar

orasidagi burchak qanday formula yordamida aniqlanadi?

a) $\cos \varphi = \frac{m_1m_2 + n_1n_2}{\sqrt{m_1^2 + n_1^2} \sqrt{m_2^2 + n_2^2}}$

$$\text{b) } \sin \varphi = \frac{m_1 m_2 + n_1 n_2}{\sqrt{m_1^2 + n_1^2} \sqrt{m_2^2 + n_2^2}}$$

$$\text{c) } \cos \varphi = \frac{m_1 m_2 + n_1 n_2}{\sqrt{m_1^2 + n_1^2} + \sqrt{m_2^2 + n_2^2}}$$

$$\text{d) } \cos \varphi = \frac{m_1 m_2 + n_1 n_2}{\sqrt{m_1^2 + n_1^2} \sqrt{m_2^2 + n_2^2}}$$

$$30. \frac{x - x_1}{l_1} = \frac{y - y_1}{m_1} \text{ va } \frac{x - x_2}{l_2} = \frac{y - y_2}{m_2} \text{ ko'rinishdagi tenglamalar bilan berilgan}$$

to'g'ri chiziqlarning parallellik va perpendikulyarlik shartlarini ko'rsating.

$$\text{a) } \frac{l_1}{l_2} = \frac{m_1}{m_2}, \quad l_1 l_2 + m_1 m_2 = 0$$

$$\text{b) } \frac{l_1}{l_2} + \frac{m_1}{m_2} = 0, \quad l_1 l_2 - m_1 m_2 = 0$$

$$\text{c) } \frac{l_1}{l_2} = -\frac{m_1}{m_2}, \quad l_1 m_2 + l_2 m_1 = 0$$

$$\text{d) } \frac{l_1}{m_2} = \frac{l_2}{m_1}, \quad l_1 m_1 - l_2 m_2 = 0$$

$$31. y = k_1 x + b_1 \text{ va } y = k_2 x + b_2 \text{ ko'rinishdagi tenglamalar bilan berilgan to'g'ri}$$

chiziqlar orasidagi burchak qanday formula yordamida aniqlanadi?

$$\text{a) } \operatorname{tg} \varphi = \frac{k_2 - k_1}{1 - k_1 k_2}$$

$$\text{b) } \operatorname{tg} \varphi = \frac{k_2 - k_1}{1 + k_1 k_2}$$

$$\text{c) } \operatorname{tg} \varphi = \frac{k_2 + k_1}{1 + k_1 k_2}$$

$$\text{d) } \operatorname{tg} \varphi = \frac{1 - k_2 k_1}{k_1 + k_2}$$

$$32. y = k_1 x + b_1 \text{ va } y = k_2 x + b_2 \text{ tenglamalari bilan berilgan ikki to'g'ri chiziqning}$$

parallellik va perpendikulyarlik shartlarini ko'rsating.

$$\text{a) } k_1 = k_2, \quad k_1 k_2 = -1$$

b) $k_1 + k_2 = 0, k_1 k_2 = 1$

c) $k_1 = -k_2, \frac{k_1}{k_2} = 1$

d) $-k_1 = k_2, k_1 = \frac{1}{k_2}$

33. $x \cos \alpha + y \sin \alpha - p = 0$ tenglama to'g'ri chiziqning qanday ko'rinishdagi tenglamasi, p - sonning geometrik ma'nosi qanday?

a) To'g'ri chiziqning umumiy tenglamasi, p - koordinata boshidan to'g'ri chiziqkacha masofa

b) To'g'ri chiziqning kanonik tenglamasi, p - ixtiyoriy son

c) To'g'ri chiziqning burchak koeffitsientli tenglamasi, p - koordinata boshidan to'g'ri chiziqkacha masofa

d) To'g'ri chiziqning normal tenglamasi, p - koordinata boshidan to'g'ri chiziqkacha masofa

34. $M_1(x_1, y_1)$ nuqtadan $x \cos \phi + y \sin \phi - p = 0$ to'g'ri chiziqgacha bo'lgan masofa qanday formula orqali hisoblanadi?

a) $d = |x_1 \cos \phi + y_1 \sin \phi - p|$

b) $d = x_1 \cos \phi - y_1 \sin \phi - p$

c)

d) $d = |x_1 \cos \phi + y_1 \sin \phi - p|$

e) $d = \frac{\sqrt{A^2 + B^2}}{|Ax_1 + By_1 - C|}$

35. $M_1(x_1, y_1)$ nuqtadan $Ax + By + C = 0$ to'g'ri chiziqgacha bo'lgan masofa qanday formula yordamida hisoblanadi?

a) $d = \frac{\sqrt{A^2 - B^2}}{|Ax_1 + By_1 + C|}$

b) $d = \frac{|Ax_1 + By_1 + C|}{\sqrt{A^2 - B^2}}$

$$c) \quad d = \frac{|Ax_1 + By_1 + C|}{\sqrt{A^2 + B^2}}$$

1. Riman sferasidagi shimoliy qutubidagi R nuqta C_z tekislikda qaysi nuqtaga akslanadi.

e) $z=0$ nuqtaga

f) $z=\infty$ nuqtaga

g) $z=z_0$ nuqtaga

h) $z=-\infty$ nuqtaga

2. $w = z^2 + 2z$ funksiya yordamida akslantrishda z tekislikning qaysi qismi kenggayib akslanadi.

e) $|z + 1| > \frac{1}{2}$

f) $|z + 1| = \frac{1}{2}$

g) $|z + 1| < \frac{1}{2}$

h) $z + 1 > \frac{1}{2}$

3. $w=z^2+2z$ funksiya yordamida akslantrishda z tekislikning qaysi qismi torayib akslanadi.

e) $|z + 1| = \frac{1}{2}$

f) $|z + 1| < \frac{1}{2}$

g) $|z + 1| > \frac{1}{2}$

h) $z + 1 > \frac{1}{2}$

4. $\cos(2+i)$ sonining haqiqiy qismini toping.

e) $\sin 1 \cdot \cos 2$

f) $\cos 2$

g) $\cos 1 \cdot \cos 2$

h) $\sin 2 \cdot \sin 1$

5. $\operatorname{Re} f(z) = x \cdot \cos x \cdot \operatorname{ch} y + y \cdot \sin x \cdot \operatorname{sh} y$, $f(0) = 0$ bo'lsin. U holda $f(z)$ holomorf funktsiyani toping:

e) $z \cdot \cos z$

f) $z \cdot \sin z$,

g) $z \cdot \operatorname{ch} z$

h) $z \cdot \operatorname{sh} z$

6. $1/\sin^2 z$ funktsiyaning $z = 0$ nuqtadagi qoldig'ini toping.

b) 1

b) $1/2$

c) 0

d) -1

7. Agar harqanday kichik $\varepsilon > 0$ uchun shunday kichik $\delta > 0$ ni ko'rsatish mumkin bo'lsaki, $|\Delta z| < \delta$ bo'lganda $|\Delta W| < \varepsilon$ bo'lsa $f(z)$ funktsiya z_0 nuqtada

e) Chegaralangan

f) Uzluksiz

g) Chegaralanmagan

h) Uzulishga ega deyiladi

8. $W = \sqrt[3]{z}$ funktsiya necha qiymatli.

e) uch qiymatli

f) ikki qiymatli

g) bir qiymatli

h) To'rt qiymatli

9. $D = \{z - 1 | z| < 2\}$ sohani $w = 1 - 2iz$ akslantirish yordamidagi aksini toping.

e) $\{w - 1 + 2i | w| < 4\}$

f) $\{w - 1 + 2i | w| < 2\}$

g) $\{|w-1-2i| < 4\}$

h) $\{|w-1-2i| < 2\}$

10. $D = \{0 < \operatorname{Re} z < 1\}$ sohani $w = 2iz + 1 - i$ akslantirish yordamidagi aksini toping.

e) $\{0 < \operatorname{Im} z < 1\}$

f) $\{-1 < \operatorname{Im} z < 1\}$

g) $\{-1 < \operatorname{Im} z < 0\}$

h) $\{-2 < \operatorname{Im} z < 2\}$

11. $x=0$ to'plamning $w = \frac{1}{z}$ akslantirish yordamidagi aksini toping.

e) $U = 0$

f) $V = 0$

g) $U = 1$

h) $V = 1$

12. Fazoda to'g'ri chiziqning vektor shaklidagi tenglamasi quyidagi tenglamalardan qaysi biri bo'ladi?

f) $V=1$

g) $V = 0$

h) $U = 0$

i) $y=0$ to'plamning $w = \frac{1}{z}$ akslantirish yordamidagi aksini toping.

j) $U = 1$

13. Quyidagi funksiyalarning qaysi biri o'zining aniqlanish sohasida quyidan chegaralangan 1) $y = x^2$; 2) $y = \log_a x$; 3) $y = \sin x$; 4) $y = \operatorname{tg} x$

a) 3 va 4

b) 2 va 3

c) 1 va 2

d) 1 va 3

14. Juft funksiyanı aniqlang: 1) $f(x) = x^2 \sin x$, 2) $f(x) = x^2 \cos x$;

3) $f(x) = x + x^3$

e) 3

f) 1

g) 2

h) 1 va 2

15. $y = x^2 - 10x - 11$ funksiyaning qiymatlar to'plamini toping.

e) $[2; +\infty)$

f) $(-\infty; +\infty)$

g) $[9; +\infty)$

h) $[-36; +\infty)$

16. $y = 5 \sin^2 x$ funksiyaning eng kichik musbat davrini toping.

c) 1

d) π

c) 2π

d) $2\pi / 5$

17. Quyidagi to'plamlarning qaysi biri a nuqtaning ε atrofi bo'ladi.

e) $(a - \varepsilon; a]$

f) $[a; a + \varepsilon)$

g) $(a - \varepsilon / 2; a + \varepsilon / 2)$

h) $(a - \varepsilon; a + \varepsilon)$

18. $\lim_{n \rightarrow \infty} 1 + \frac{1}{3n}^{2n}$ limitni toping.

e) - e^6

f) - e^3

g) + $e^{2/3}$

h) - e

19. $\lim_{x \rightarrow} \frac{x^3 - 3x + 2}{x^4 - 4x + 3}$ ni hisoblang.

e) $2/3$

f) 0

g)

h) 10

20. $\lim_{x \rightarrow 4} \frac{3 - \sqrt{5+x}}{1 - \sqrt{5-x}}$ ni hisoblang.

e) $2/3$

f) $-1/3$

g) 2

h) -3

21. Limitni toping $\lim_{x \rightarrow 2} \frac{x^2 - 6x + 8}{x^2 - 3x + 2}$

e) -2

f) 6

g) -3

h) 4

22. Quyidagi jumalarning qaysi biri xato?

e) $[a; b]$ segmentda uzluksiz funksiya shu segmentda chegaralangan bo'ladi.

f) $[a; b]$ segmentda uzluksiz funksiya shu segmentda tekis uzluksiz bo'ladi.

g) $[a; b]$ segmentda uzluksiz funksiyaning qiymatlar to'plami ham segment bo'ladi.

h) $[a;b]$ segmentda uzluksiz bo'lgan funksiya shu segmentda monoton bo'ladi.

23. Agar $\{x_n\}$ ketma-ketlik uchun $\forall M \in R, \exists n_0 \in N : x_{n_0} > M$ bo'lsa, ketma-ketlik deyiladi.

- e) yuqoridan chegaralanmagan
- f) quyidan chegaralanmagan
- g) yuqoridan chegaralangan
- h) quyidan chegaralangan

24. Agar shunday o'zgarmas M soni mavjud bo'lsaki, ixtiyoriy x_n ($n = 1, 2, 3, \dots$) uchun $x_n \leq M$ tengsizlik bajarilsa, $\{x_n\}$ ketma-ketlik deyiladi.

- e) quyidan chegaralangan
- f) yuqoridan chegaralangan
- g) yuqoridan chegaralanmagan
- h) quyidan chegaralanmagan

25. Agar $f(x) + \frac{1}{x} = x^2 + \frac{1}{x^2}$ bo'lsa, $f(x)$ ni toping.

- e) x^2+1
- f) x^2-1
- g) x^2-2
- h) $x+2$

26. $Ax + By + Cz + D = 0$ tekislikning umumiy tenglamasida A, B, C koeffisientlar qanday geometrik ma'noga ega?

- e) Tekislik yo'naltiruvchi vektorinig koordinatlari
- f) Tekislikning normal vektorining koordinatlari
- g) Tekislikda joylashgan vektorning koordinatlari
- h) Tekislikka parallel vektorning koordinatalari

27. $Ax + By + Cz = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday joylashgan?

- e) Oz o'qiga parallel
- f) Oy o'qiga parallel
- g) Ox o'qiga parallel
- h) Koordinata boshidan o'tadi

28. $By + Cz + D = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday joylashgan?

- e) Oy o'qiga parallel
- f) Oz o'qiga parallel
- g) Ox o'qiga parallel
- h) Koordinata boshi orqali o'tadi

29. $Cz + D = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday joylashgan?

- e) Oy o'qiga parallel
- f) Ox o'qiga parallel
- g) Koordinata boshidan o'tadi
- h) xOy koordinata tekisligiga parallel

30. Tenglamasi $By + D = 0$ bo'lgan tekislik koordinata tekisliklariga nisbatan qanday joylashgan?

- e) xOz koordinata tekisligiga parallel
- f) yOz koordinata tekisligiga parallel
- g) xOy koordinata tekisligiga parallel
- h) Oy o'qiga parallel

31. $Ax + D = 0$ tenglama bilan berilgan tekislik koordinata tekisliklariga nisbatan qanday joylashgan?

- e) yOz koordinata tekisligiga parallel
- f) Ox o'qiga parallel
- g) yOx koordinata tekisligiga parallel
- h) xOz koordinata tekisligiga parallel

32. $Cz = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday joylashgan?

- e) Oy o'qidan iborat
- f) xOz koordinata tekisligi bilan ustma-ust tushadi
- g) xOy koordinata tekisligi bilan ustma-ust tushadi
- h) Ox o'qidan iborat

33. $By = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday joylashgan?

- e) xOz tekisligidan iborat
- f) xOy tekisligidan iborat
- g) Ox o'qidan iborat
- h) Oy o'qidan iborat

34. $Ax = 0$ tenglama bilan berilgan tekislik koordinata sistemasiga nisbatan qanday joylashgan?

- e) xOy tekisligi bo'ladi
- f) Oy o'qidan iborat bo'ladi
- g) Ox o'qidan iborat bo'ladi
- h) yOz tekisligi bo'ladi

35. $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$ ko'rinishdagi tenglama qanday ataladi va a, b, c sonlar qanday geometrik ma'noga ega?

- c) Tekislikning kesmalariga nisbatan tenglamasi, a, b, c -sonlar mos ravishda, Ox, Oy, Oz o'qlardan ajratgan kesmalarining kattaliklari
- d) Tekislikning umumiy tenglamasi; a, b, c - ixtiyoriy sonlar
- e) Tekislikning kesmalarga nisbatan tenglamasi, a, b, c -tekislik normal vektorining koordinatalari

1. $\{-1 \leq x \leq 1; y = 0\}$ to'plamning $w = \frac{1}{z}$ akslantirish yordamidagi aksini toping..

a) $\{1 - |w|; v = 1\}$

b) $\{|w| - 1; v = 0\}$

c) $\{1 - |w|; v = 0\}$

d) $\{|w| - 1; v = 1\}$

2. $\operatorname{Re} z = 1$ to'plamning $\{|w| = e^z\}$ akslantirish yordamidagi aksini toping.

a) $\{|w| = e; \}$

b) $\{|w| = 1; \}$

c) $\{w = e; \}$

d) $\{w = 1; \}$

3. $\operatorname{Re} z = -1$ to'plamning $\{|w| = e^z\}$ akslantirish yordamidagi aksini toping.

a) $\{|w| = 1; \}$

b) $|w| = \frac{1}{e};$

c) $\{w = e; \}$

d) $\{w = 1; \}$

4. $\{|w| = e^z\}$ funksiyaning $z = \pi i$ nuqtadagi qiymatini toping

a) -1

b) 0

c) π

d) 1

5. $\{|w| = e^z\}$ funksiyaning $z = 2\pi i$ nuqtadagi qiymatini toping

a) -1

b) 0

c) 1

d) π

6. $\cos z$ funksiyaning faqat haqiqiy qiymatlar qabul qiladigan nuqtalari to'plamini toping.

a) $Imz = 0 \quad Rez = k\pi \quad k = 0, \pm 1, \pm 2, \dots$

b) $Imz = 0 \quad Rez = \pi$

c) $Imz = 0 \quad Rez = 2k\pi \quad k = 0, \pm 1, \pm 2, \dots$

d) $Imz = 1 \quad Rez = k\pi \quad k = 0, \pm 1, \pm 2, \dots$

7. $\sin z$ funksiyaning faqat haqiqiy qiymatlar qabul qiladigan nuqtalari to'plamini toping.

a) $Imz = 0 \quad Rez = 2k\pi \quad k = 0, \pm 1, \pm 2, \dots$

b) $Imz = 0 \quad Rez = k\pi \quad k = 0, \pm 1, \pm 2, \dots$

c) $Imz = 0 \quad Rez = (k + 1/2)\pi \quad k = 0, \pm 1, \pm 2, \dots$

d) $Imz = 1 \quad Rez = k\pi \quad k = 0, \pm 1, \pm 2, \dots$

8. $\sin z$ funksiyaning faqat mavhum qiymatlar qabul qiladigan nuqtalari to'plamini toping.

a) $Imz = 0 \quad Rez = \pi$

b) $Imz = 0 \quad Rez = k\pi \quad k = 0, \pm 1, \pm 2, \dots$

c) $Imz = 0 \quad Rez = 2k\pi \quad k = 0, \pm 1, \pm 2, \dots$

d) $Imz = 1 \quad Rez = k\pi \quad k = 0, \pm 1, \pm 2, \dots$

9. $\cos z$ funksiyaning faqat mavhum qiymatlar qabul qiladigan nuqtalari to'plamini toping.

a) $Imz = 0 \quad Rez = 2k\pi \quad k = 0, \pm 1, \pm 2, \dots$

b) $Imz = 0 \quad Rez = k\pi \quad k = 0, \pm 1, \pm 2, \dots$

c) $Imz = 0 \quad Rez = (k + 1/2)\pi \quad k = 0, \pm 1, \pm 2, \dots$

d) $Imz = 0 \quad Rez = \pi$

10. $w = 2z - 1$ funksiyaning haqiqiy qismini toping .

a) $U(x, y) = 2x$

b) $U(x, y) = 2y - 1$

c) $U(x, y) = 2x - 1$

d) $U(x, y) = 2x + 1$

11. $w = 2z^2 - 1$ funksiyaning haqiqiy qismini toping .

a) $u(x, y) = 2(x^2 - y^2) - 1$

b) $u(x, y) = (x^2 - y^2) - 1$

c) $u(x, y) = 2(x^2 + y^2) - 1$

d) $u(x, y) = 2(x^2 - y^2)$

12. $w = \bar{z} - 1$ funksiyani haqiqiy qismini toping .

a) $U(x, y) = 2x$

b) $U(x, y) = 2y - 1$

c) $U(x, y) = 2x - 1$

d) $U(x, y) = 2x + 1$

13. Agar $\forall x_1, x_2 \in X$ uchun $x_1 < x_2$ bo'lganda $f(x_1) < f(x_2)$ tengsizlik bajarilsa, $f(x)$ funksiya X to'plamda deyiladi.

a) qat'iy kamayuvchi

b) o'smovchi

c) qat'iy o'suvchi

d) kamayuvchi

14. Qaysi javobda birinchi ajoyib limit berilgan?

a) $\lim_{x \rightarrow +\infty} 1 + \frac{1}{x}^x = e$

b) $\lim_{x \rightarrow +\infty} \frac{x^m}{a^x} = 0$

c) $\lim_{x \rightarrow +\infty} 1 + \frac{1}{x}^x = e$

d) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$

15. $\lim_{x \rightarrow 1} \frac{x + x^2 + x^3 + \dots + x^n - n}{x - 1}$ limitni hisoblang.

a) $\frac{n(n-1)}{2}$

- b) $\frac{n(n+1)}{2}$
c) 1
d) 0

16. Agar $\forall \varepsilon > 0, \exists \delta > 0, \forall x \in (x_0 - \delta, x_0): |f(x) - b| < \varepsilon$ bo'lsa, b son $f(x)$

funksiyasining x_0 nuqtadagi deyiladi

- a) chap limiti
b) o'ng limiti
c) limiti
d) hosilasi

17. $x_n = \frac{n!}{n^n}$ ketma-ketlikning limiti topilsin.

- a) 3
b) 2
c) 1
d) 0

18. Uzilishga ega bo'lgan funksiyani ko'rsating.

- a) $f(x) = x^2$
b) $f(x) = \frac{1}{x-1}$
c) $f(x) = |x|$
d) $f(x) = \sin x$

19. Uzluksiz funksiyani ko'rsating.

- a) $f(x) = \frac{1}{x-1}$
b) $f(x) = \frac{\sin x}{x}$
c) $f(x) = \frac{x}{x^2+1}$

d) $f(x) = \begin{cases} x, & x \geq 1 \\ 2, & x < 1 \end{cases}$

20. Chegaralangan ketma-ketlikni toping.

a) $x_n = (-1)^n n, \quad n \in N$

b) $x_n = \frac{n^2 + 1}{n + 1}, \quad n \in N$

c) $x_n = n^2, \quad n \in N$

d) $x_n = \frac{1}{n}, \quad n \in N$

21. k ning qanday qiymatlarida $f(x) = x^3 - kx^2 + 3x - 1$ funksiya o'suvchi bo'ladi?

a) $(-2; 2)$

b) $[-3; 3]$

c) $(-\infty; -4)$

d) $(3; \infty)$

22. Agar $x = 3(t - \sin t)$, $y = 3(1 - \cos t)$ bo'lsa, $\frac{dy}{dx}$ ni toping.

a) $-\tan t$

b) $\cot t$

c) $\cot \frac{t}{2}$

d) $\tan \frac{t}{2}$

23. $f(x) = \sin x - bx + c$ funksiya b ning qanday qiymatlarida o'suvchi bo'ladi?

a) $b < 1$

b) $b < 0$

c) $b \geq 1$

d) $b \leq -1$

24. $y = \begin{cases} \alpha x + \beta, & \text{agar } x \leq 1, \\ x^2, & \text{agar } x > 1 \end{cases}$ funksiya sonlar o'qida differensiallanuvchi

bo'ladigan α va β qiymatlarini toping.

a) $\alpha=1, \beta=2$

b) $\alpha=2, \beta=-1$

c) $\alpha=2, \beta=1$

d) $\alpha=-2, \beta=1$

25. Ushbu funksiyaning hosilalarini toping: $f(x) = \ln^2(3-5x)$

a) $\frac{10\ln(3-5x)}{3-5x}$

b) $-10\ln(3-5x)$

c) $\frac{-10\ln(3-5x)}{3-5x}$

d) $-\frac{10}{3-5x}$

26. Bir to'g'ri chiziqda yotmaydigan uchta $M_1(x_1, y_1, z_1)$, $M_2(x_2, y_2, z_2)$ va

$M_3(x_3, y_3, z_3)$ nuqtalardan o'tuvchi tekislik tenglamasini yozing.

a) $\frac{x-x_1}{x_3-x_2} = \frac{y-y_1}{y_3-y_2} = \frac{z-z_1}{z_3-z_2}$

b) $\begin{vmatrix} x-x_1 & y-y_1 & z-z_1 \\ l_1 & m_1 & n_1 \\ l_2 & m_2 & n_2 \end{vmatrix} = 0$

c) $\begin{vmatrix} x-x_1 & y-y_1 & z-z_1 \\ a & b & c \\ A & B & C \end{vmatrix} = 0$

d) $\begin{vmatrix} x-x_1 & y-y_1 & z-z_1 \\ x_2-x_1 & y_2-y_1 & z_2-z_1 \\ x_3-x_1 & y_3-y_1 & z_3-z_1 \end{vmatrix} = 0$

27. $x \cos \alpha + y \cos \beta + z \cos \gamma - p = 0$ ko'rinishdagi tenglama tekislikning qanday ko'rinishdagi tenglamasi deyiladi va p soni qanday

geometrik ma'noga ega?

- a) Tekislikning normal tenglamasi; p koordinata boshidan tekislikgacha bo'lgan masofa
- b) Tekislikning normal ko'rinishdagi tenglamasi; p - ixtiyoriy son
- c) Tekislikning umumiy tenglamasi; p - koordinata boshidan tekislikgacha masofa
- d) Tekislikning normal ko'rinishdagi tenglamasi; p - normal vektorning koordinatlari

28. $M_1(x_1, y_1, z_1)$ nuqtadan berilgan $x \cos \alpha + y \cos \beta + z \cos \gamma - p = 0$ tekislikgacha masofa qanday formula bilan hisoblanadi?

- a) $d = |x_1 \cos \alpha - y_1 \cos \beta - z_1 \cos \gamma|$
- b) $d = |x_1 \cos \alpha + y_1 \cos \beta + z_1 \cos \gamma + p|$
- c) $d = |x_1 \cos \alpha + y_1 \cos \beta - z_1 \cos \gamma - p|$
- d) $d = |x_1 \cos \alpha + y_1 \cos \beta + z_1 \cos \gamma - p|$

29. $M_1(x_1, y_1, z_1)$ nuqtadan $Ax + By + Cz + D = 0$ tekislikgacha masofa qanday formula yordamida hisoblanadi.

- a) $d = \frac{|Ax_1 + By_1 + Cz_1 + D|}{\sqrt{A^2 + B^2 + C^2}}$
- b) $d = \frac{Ax_1 + By_1 + Cz_1 + D}{\sqrt{A^2 + B^2 + C^2}}$
- c) $d = \frac{|Ax_1 + By_1 + Cz_1|}{\sqrt{A^2 + B^2 + C^2}}$
- d) $d = |x_1 \cos \alpha + y_1 \cos \beta - z_1 \cos \gamma|$

30. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ ko'rinishdagi tenglama fazoda to'g'ri chiziqlarning

qanday ko'rinishdagi tenglamasi deyiladi va l, m, n sonlarning geometrik ma'nosi qanday bo'ladi?

- a) Fazoda to'g'ri chiziqlarning kanonik tenglamasi l, m, n to'g'ri chiziq normal vektorining koordinatlari

- b) Fazoda to'g'ri chiziqning kanonik tenglamasi l, m, n to'g'ri chiziq yo'naltiruvchi vektorining koordinatlari
- c) To'g'ri chiziqning umumiy tenglamasi; l, m, n yo'naltiruvchi vektorning koordinatlari
- d) To'g'ri chiziqning geometrik tenglamasi; l, m, n - ixtiyoriy sonlar

31. Fazoda ikki $M_1(x_1, y_1, z_1)$ va $M_2(x_2, y_2, z_2)$ nuqtalardan o'tuvchi to'g'ri chiziq tenglamasini yozing.

- a) $\frac{x - x_1}{y_2 - y_1} = \frac{y - y_1}{x_2 - x_1}$
- b) $\frac{x + x_1}{x_2 + x_1} = \frac{y + y_1}{y_2 + y_1} = \frac{z + z_1}{z_2 + z_1}$
- c) $\frac{x - x_1}{x_2 - x_1} = \frac{y - y_1}{y_2 - y_1} = \frac{z - z_1}{z_2 - z_1}$
- d) $\frac{x - x_1}{l} = \frac{y - y_1}{m} = \frac{z - z_1}{n}$

32. Fazoda to'g'ri chiziqning vektor shaklidagi tenglamasi quyidagi tenglamalardan qaysi biri bo'ladi?

- a) $A_1x + B_1y + C_1z = 0$
 $A_2x + B_2y + C_2z = 0$
- b) $\frac{x - x_0}{l} = \frac{y - y_0}{m} = \frac{z - z_0}{n}$
- c) $\frac{x - x_1}{x_2 - x_1} = \frac{y - y_1}{y_2 - y_1} = \frac{z - z_1}{z_2 - z_1}$
- d) $\vec{r} = \vec{r}_0 + t\vec{a}$

33. $A_1x + B_1y + C_1z + D = 0$ tenglama fazoda qaysi holda to'g'ri chiziqni

$A_2x + B_2y + C_2z + D = 0$

ifodalaydi?

- a) $\text{rang} \begin{pmatrix} A_1 & B_1 & C_1 \\ A_2 & B_2 & C_2 \end{pmatrix} = 1$ bo'lsa
- b) $\text{rang} \begin{pmatrix} A_1 & B_1 & C_1 \\ A_2 & B_2 & C_2 \end{pmatrix} = 2$ bo'lsa

c) $D_1 = 0, D_2 = 0$ bo'lsa

d) $D_1 \neq 0, D_2 \neq 0$ bo'lsa

34. Quyidagi tenglamalardan qaysi biri to'g'ri chiziqning parametrik tenglamasi deyiladi?

a) $\frac{x - x_0}{l} = \frac{y - y_0}{m} = \frac{z - z_0}{n}$

b) $A_1x + B_1y + C_1z + D = 0$
 $A_2x + B_2y + C_2z + D = 0$

$x = x_0 + lt$

c) $y = y_0 + mt$

$z = z_0 + nt$

d) $r = r_0 + \lambda t$

35. Berilgan ikkita $\frac{x - x_1}{l_1} = \frac{y - y_1}{m_1} = \frac{z - z_1}{n_1}$ va $\frac{x - x_2}{l_2} = \frac{y - y_2}{m_2} = \frac{z - z_2}{n_2}$ to'g'ri

chiziqlar orasidagi burchak qanday formula yordamida topiladi?

a) $\sin \phi = \frac{l_1 l_2 + m_1 m_2 + n_1 n_2}{\sqrt{l_1^2 + m_1^2 + n_1^2} \sqrt{l_2^2 + m_2^2 + n_2^2}}$

b) $\cos \phi = \frac{l_1 l_2 + m_1 m_2 + n_1 n_2}{\sqrt{l_1^2 + m_1^2 + n_1^2} + \sqrt{l_2^2 + m_2^2 + n_2^2}}$

c) $\cos \phi = \frac{l_1 l_2 + m_1 m_2 + n_1 n_2}{\sqrt{l_1^2 + m_1^2 + n_1^2} - \sqrt{l_2^2 + m_2^2 + n_2^2}}$

1. $w = 2\bar{z} - 1$ funksiyaning mavhum qismini toping .

e) $V(x, y) = -2y - 1$

f) $V(x, y) = -2y$

g) $V(x, y) = -2y + 1$

h) $V(x, y) = 2y - 1$

2. $w = 2z^2 - 1$ funksiyaning mavhum qismini toping .

e) $V(x, y) = -2xy - 1$

f) $V(x, y) = 2xy - 1$

g) $V(x, y) = -2xy$

h) $V(x, y) = 2xy$

3. $\int_{\gamma} x dz$ integralni hisoblang bunda , integrallash chizig'i boshi a va oxiri b

nuqtada bo'lgan egri chiziq.

e) $-b - a$

f) $b - a$

g) $a - b$

h) 0

4. $\int_{\gamma} x dz$ integralni hisoblang bunda , integrallash

chizig'i $I = \{z \in C : |z| = 1, 0 \leq \arg z < \pi\}$

e) $\frac{i\pi}{2}$

f) $i\pi$

g) $-\frac{i\pi}{2}$

h) $-i\pi$

5. $\oint_C |z| z dz$ integralni hisoblang bunda , integrallash chizig'i $I = \{z \in C : |z| = 1, \operatorname{Im} z > 0\}$

e) $i\pi$

f) $-i\pi$

g) 0

h) 1

6. Funksiyaning hosilalari uchun quyidagilardan qaysi biri

1. $f(z) = (\sin az)' = a \cos az$

o'rinli. 2. $f(z) = (ze^{az})' = \frac{1}{a}(z - \frac{1}{a})e^z$

3. $f(z) = (\cos az)' = -a \sin az$

e) 1,2

f) 1

g) 1,3

h) 1,2

7. $\oint_{|z|=2} \frac{dz}{z^2+1}$ integralni hisoblang

e) 1

f) π

g) 0

h) -1

8. $\oint_{|z-i|=2} \frac{dz}{z^2+1}$ integralni hisoblang

e) -1

f) 0

g) $-\pi$

h) π

9. $\sum_{n=1}^{\infty} \frac{i^n}{n}$ qatorning dastlabki uchta hadini toping

e) $i, \frac{i}{2}, \frac{i}{3}$

f) $-i, -i/2, -i/3$

g) $i, -i/2, -i/3$

h) $i, i/2, -i/3$

10. $\sum_{n=1}^{\infty} \frac{i^{n\varphi}}{n}$ qatorning birinchi hadini toping

e) e^{φ}

f) $e^{in\varphi}$

g) $\cos \varphi + i \sin \varphi$

h) $-e^{\varphi}$

11. $f(a) = 0$ bo'lsa

e) n -tartibli noli

f) Funksiya a nuqtada uzluksiz

g) * a soni $f(z)$ funksiyaning noli

h) a uzilish nuqtasi

12. $w = f(z)$ funksiya $\text{Im} z > 0$ yuqori yarim tekislikni $|w| < 1$ birlik doiraga

$f(i) = 0$, $\arg f'(i) = -\frac{\pi}{2}$ shartlari bilan conform akslantirsin. U

holda $f(2i) = ?$

e) $i/4$

f) $i/2$

g) $1/3$

h) $1/5$

13. $y = 2x^2 - x - 1$ funksiya berilgan. 1) kamayish oraliqlarini; 2) o'sish

oraliqlarini aniqlang.

e) 1) $(- ; 0,25)$, 2) $(0,25;)$

f) 1) $(-0,25;)$, 2) $(- ; -0,25)$

g) 1) $(0,25;)$, 2) $(- ; 0,25)$

h) 1) $(- ; -0,25)$, 2) $(-0,25;)$

14. Ushbu $y = -4x^3 + 12x$ funksiyaning lokal minimumini toping.

e) 0

f) -16

g) -8

h) 4

15. $f(x) = 3x - x^2$ funksiyaning $[x_0, x_0 + \Delta x]$ kesmadagi orttirmasini toping.

e) $\Delta f(x_0) = (2x_0 - 3)\Delta x + (\Delta x)^2$

f) $\Delta f(x_0) = (3 - 2x_0)\Delta x + (\Delta x)^2$

g) $\Delta f(x_0) = (2x_0 - 3)\Delta x + (\Delta x)^3$

h) $\Delta f(x_0) = (3 - 2x_0)\Delta x - (\Delta x)^2$

16. Massasi 10 kg bo'lgan jism $s(t) = t^2 + 2t + 3$ qonuniyat bilan to'g'ri chiziqli

harakatlanmoqda. Jismning $t=3$ c vaqtdagi kinetik energiyasini aniqlang.

- e) 3200 J
- f) 340 J
- g) 320J
- h) 250 J

17. Quyidagi hollarning qaysi birida $f(x)$ funksiya $(a;b)$ da kamayuvchi bo'ladi?

- e) $(a;b)$ da $f'(x)>0$
- f) $(a;b)$ da $f'(x)<0$
- g) $(a;b)$ da $f''(x)<0$
- h) $(a;b)$ da $f''(x)>0$

18. Quyidagi hollarning qaysi birida $f(x)$ funksiya $(a;b)$ da qavariq bo'ladi?

- e) $(a;b)$ da $f'(x)>0$
- f) $(a;b)$ da $f'(x)<0$
- g) $(a;b)$ da $f''(x)<0$
- h) $(a;b)$ da $f''(x)>0$

19. Quyidagi funksiyalarning qaysi birlari o'z aniqlanish sohasida kamayuvchi bo'ladi. 1) $f(x)=3-4x$; 2) $f(x)=1-x^2$; 3) $f(x)=\sin x$; 4) $f(x)=-x^3$

- e) 2 va 4
- f) 2 va 3
- g) 1 va 3
- h) 1 va 4

20. Agar $f(x) = 2\sin x - 4\sqrt{3}\cos x$ bo'lsa, $f\left(\frac{\pi}{3}\right)$ ni hisoblang.

- e) 7
- f) -5
- g) $2+4\sqrt{3}$
- h) 0

21. Integralni hisoblang: $\int \frac{dx}{1+x^2}$

e) $\frac{\pi\sqrt{2}}{2}$

f) π

g) $\frac{\pi\sqrt{2}}{4}$

h) 0

22. $f(x) = x + x^3$ funksiyaning hosilasini toping.

e) $f(x) = 1 + x^2$

f) $f(x) = 1 + 3x^3$

g) $f(x) = 1 + 3x^2$

h) $f(x) = 3 + 3x^2$

23. Agar $F(x)$ funksiya $f(x)$ funksiyaning boshlang'ich funksiyasi bo'lsa, quyidagi formulalardan qaysi biri to'g'ri? ($k \neq 0$)

e) $\int f(kx)dx = kF\left(\frac{1}{k}x\right) + C$

f) $\int f(b-kx)dx = \frac{1}{k}F(b-kx) + C$

g) $\int f(kx)dx = kF(x) + C$

h) $\int f(b-kx)dx = -\frac{1}{k}F(b-kx) + C$

24. $f(x) = x^2$ funksiyaning $M(-1;3)$ nuqtadan o'tuvchi boshlang'ich funksiyasini toping.

a) $F(x) = x^3 + 5/3$

b) $F(x) = x^3 / 3$

c) $F(x) = x^3 / 3 + 10/3$

d) $F(x) = x^3 / 3 + 3$

25. $\sin^3 x \cos^3 x dx$ ni hisoblang.

e) $\frac{1}{12} \sin 6x + C$

f) $-\frac{1}{12} \cos 6x + C$

g) $-9 \cos x \sin x + C$

h) $\frac{1}{6} \cos 6x + C$

26. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziq va $Ax + By + Cz + D = 0$ tekislik umumiy

nuqtaga ega bo'lmaslik (parallellik) shartini ko'rsating.

e) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

f) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

g) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

h) $\frac{A}{l} = \frac{B}{m} = \frac{C}{n}$

27. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziqning $Ax + By + Cz + D = 0$ tekislikka

perpendikulyarlik shartini ko'rsating.

e) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

f) $\frac{A}{l} = \frac{B}{m} = \frac{C}{n}$

g) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

h) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

28. $\frac{x-x_0}{l} = \frac{y-y_0}{m} = \frac{z-z_0}{n}$ to'g'ri chiziqning $Ax + By + Cz + D = 0$ tekislikda

yotish shartini ko'rsating.

e) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

f) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

g) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

h) $\frac{A}{l} = \frac{B}{m} = \frac{C}{n}$

29. $\frac{x - x_0}{l} = \frac{y - y_0}{m} = \frac{z - z_0}{n}$ to'g'ri chiziqning $Ax + By + Cz + D = 0$ tekislik

bilan bir nuqtada kesishish shartini ko'rsating.

e) $\frac{A}{l} + \frac{B}{m} + \frac{C}{n} = 1$

f) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

g) $Al + Bm + Cn = 0$

h) $Al + Bm + Cn = 0, Ax_0 + By_0 + Cz_0 + D = 0$

30. $A_1x + B_1y + C_1z + D = 0, A_2x + B_2y + C_2z + D_2 = 0$ va $A_3x + B_3y + C_3z + D_3 = 0$ tenglamalar

bilan berilgan tekisliklarning bir nuqtada kesishish shartini ko'rsating.

e) $\begin{vmatrix} A_1 & B_1 & C_1 \\ A_2 & B_2 & C_2 \\ A_3 & B_3 & C_3 \end{vmatrix} = 0$

f) $\begin{vmatrix} A_1 & B_1 & C_1 \\ A_2 & B_2 & C_2 \\ A_3 & B_3 & C_3 \end{vmatrix} = 0$

g) $\frac{A_1}{A_2} = \frac{B_1}{B_2} = \frac{C_1}{C_2}$

h) $\frac{A_1}{A_3} = \frac{B_1}{B_3} = \frac{C_1}{C_3}$

31. $\vec{a}$ va $\vec{b}$ vektorlarning skalyar ko'paytmasi quyidagicha bo'ladi

e) $\vec{a} \vec{b} = |\vec{a}| |\vec{b}| \sin \varphi$

$$\text{f) } \vec{a} \vec{b} = |\vec{a}| |\vec{b}| \cos \varphi$$

$$\text{g) } \vec{a} \vec{b} = |\vec{a}| |\vec{b}| \operatorname{tg} \varphi$$

$$\text{h) } \vec{a} \vec{b} = |\vec{a}| |\vec{b}| \operatorname{ctg} \varphi$$

32. $\vec{a}$ va $\vec{b}$ vektorlar orasidagi burchak quyidagi formula yordamida aniqlanadi:

$$\text{e) } \cos \varphi = \frac{\vec{a} \vec{b}}{|\vec{a}| |\vec{b}|}$$

$$\text{f) } \sin \varphi = \frac{|\vec{a}| |\vec{b}|}{\sqrt{a^2} \sqrt{b^2}}$$

$$\text{g) } \operatorname{ctg} \varphi = \frac{\vec{a} \vec{b}}{\sqrt{a^2} \sqrt{b^2}}$$

$$\text{h) } \operatorname{tg} \varphi = \frac{\vec{a} \vec{b}}{|\vec{a}| |\vec{b}|}$$

33. Ixtiyoriy $\vec{a}$ va $\vec{b}$ vektorlar uchun quyidagi munosabatlardan qaysi biri o'rinli.

$$\text{e) } (ab)^2 > a^2 b^2$$

$$\text{f) } (ab)^2 = a^2 b^2$$

$$\text{g) } (ab)^2 < a^2 b^2$$

$$\text{h) } (ab)^2 = a^2 b^2$$

34. Koordinatalari bilan berilgan $\vec{a}$ va $\vec{b}$ vektorlarning vektor ko'paytmasi quyidagicha bo'ladi:

$$\text{e) } [\vec{a}, \vec{b}] = |\vec{a}| |\vec{b}| \cos \varphi$$

$$\text{f) } \vec{a}, \vec{b} = \sqrt{a_1^2 + a_2^2 + a_3^2} \cdot \sqrt{b_1^2 + b_2^2 + b_3^2} \sin \phi$$

$$\text{g) } \vec{a}, \vec{b} = \sqrt{a_1^2 + a_2^2 + a_3^2} \cdot \sqrt{b_1^2 + b_2^2 + b_3^2} \cos \phi$$

$$\text{h) } \vec{a}, \vec{b} = \vec{i} \begin{vmatrix} a_2 & a_3 \\ b_2 & b_3 \end{vmatrix} - \vec{j} \begin{vmatrix} a_1 & a_3 \\ b_1 & b_3 \end{vmatrix} + \vec{k} \begin{vmatrix} a_1 & a_2 \\ b_1 & b_2 \end{vmatrix}$$

35. $\vec{a}$ va $\vec{b}$ vektorlarning vektor ko'paytmasi bo'lgan vektorning uzunligi

quyidagiga teng.

c) $[\vec{a}, \vec{b}] = |\vec{a}||\vec{b}|\sin \varphi$

d) $[\vec{a}, \vec{b}] = |\vec{a}||\vec{b}|\operatorname{tg} \varphi$

e) $[\vec{a}, \vec{b}] = |\vec{a}||\vec{b}|\cos \varphi$

1. $w = f(z)$ funksiya $\operatorname{Im} z > 0$ yuqori yarimtekislikni $|w| < 1$ birlik doiraga

$f(2i) = 0$, $\arg f'(2i) = 0$ shartlari bilan conform akslantirsin. U holda

$f(3i) =$

e) $i/3$

f) $i/2$

g) $i/5$

h) $2/3$

2. $\operatorname{Ref}(z) = x^3 + 6x^2y - 3xy^2 - 2y^3$, $f(0) = 0$ bo'lsin. U holda $f(z)$

golomorf funksiyaning toping:

e) $3(z-1)^3$

f) $2iz^3$

g) $(1-2i)z^3$

h) $2z^3 - 3$

3. $\operatorname{Ref}(z) = ex(x \cdot \cos y - y \cdot \sin y)$, $f(0) = 0$ bo'lsin. U holda $f(z)$

golomorf funksiyaning toping:

e) $ez \sin z$

f) zez

g) $z \cos z e^z$

h) $z + ez$

4. $\operatorname{Ref}(z) = x \cdot \cos x \cdot \operatorname{ch} y + y \cdot \sin x \cdot \operatorname{sh} y$, $f(0) = 0$ bo'lsin. U holda $f(z)$

golomorf funksiyaning toping:

e) $z \operatorname{sh} z$

f) $\sin z$

g) $z \operatorname{ch} z$

h) $z \cos z$

5. $Im f(z) = y \cdot \cos y \cdot \operatorname{ch} x + x \cdot \sin y \cdot \operatorname{sh} x$, $f(0) = 0$ bo'lsin.

U holda $f(z)$ holomorffunksiyanitoping:

e) $i \cdot z \cdot \cos z$,

f) $\operatorname{ch} z$

g) $\sin z \cdot \operatorname{ch} z$

h) $\cos z \cdot \operatorname{sh} z$

6. $z = (1 + i)8 \cdot (1 - i\sqrt{3}) - 6$ uchun $|z|$ va $\arg z$ mos ravishda

e) $\frac{1}{4}, \pi$

f) $\frac{\sqrt{3}}{2}, 0$

g) $\frac{1}{4}, 0$

h) $\frac{1}{4}, \frac{\pi}{6}$

7. Parallelogrammning uchta uchlari berilgan: $z_1 = 1 + i$, $z_2 = 2 + 1,5 \cdot i$, $z_3 = 3 + 3 \cdot i$. z_2 uchiga qarama-qarshi yotuvchi to'rtinchi z_4 uchini toping.

e) $z_4 = 2 + 2,5 \cdot i$

f) $z_4 = 1,5 + 2 \cdot i$

g) $z_4 = 1,5 + 2,5 \cdot i$

h) $z_4 = 2 + 2 \cdot i$

8. $\cos(2 + i)$ sonining haqiqiy qismini toping.

e) $\sin 2 \cdot \sin 1$

f) $\cos 2 \cdot \sin 1$

g) $\operatorname{ch} 1 \cdot \cos 2$

h) $\operatorname{sh} 1 \cdot \cos 2$

9. $\operatorname{ctg}(\frac{\pi}{4} - i \cdot \ln 2)$ sonining mavhum qismini toping.

e) -1

- f) 0
- g) 15/17
- h) 12/15

10. $f(z) = z^2$ funksiya quyida keltirilgan sohalarning qaysi birida bir yaproqli.

- e) $0 < \arg z < \frac{\pi}{2}$
- f) 0
- g) $|z| < 1$
- h) $-\frac{\pi}{2} \leq \arg z \leq \frac{\pi}{2}$

11. $M(z)$ nuqtaning S sferasidagi koordinatalari (ζ, η, ξ) bo'lsa $M(-z)$ ning koordinatlarini toping.

- e) $(-\zeta, -\eta, \xi)$
- f) $(-\zeta, \eta, \xi)$
- g) (ζ, η, ξ)
- h) $(-\zeta, -\eta, -\xi)$

12. $\{\xi > 0\}$ Haqiqiy o'qdan yuqorida joylashgan tekislik tenglamasi.

- e) $\operatorname{Re} z < 0$
- f) $\operatorname{Im} z < 0$
- g) $\operatorname{Im} z > 0$
- h) $\operatorname{Re} z > 0$

13. $\ln x dx$ ni toping.

- e) $x \ln x + x + C$
- f) $x \ln x - x + C$
- g) $x \ln x + C$
- h) $0,5 \ln^2 x + C$

14. Sodda ratsional kasrni ko'rsating.

- e) $\frac{3-x}{x^2+2x-3}$

f) $\frac{x-1}{x+1}$

g) $\frac{x+6}{(x+2)^2}$

h) $\frac{x-1}{x^2+x+1}$

15. $y = (x-3)(x^2 + 3x + 9)$ funksiyaning $x=3$ nuqtadagi hosilasini toping.

e) 0

f) 27

g) 3

h) 9

16. $\frac{xdx}{x^4+1}$ integralni hisoblang.

e) $\arctg \frac{x}{4} + C$

f) $\arctg 4x + C$

g) $\frac{1}{2} \arctg^2 x + C$

h) $\frac{1}{2} \arctg x^2 + C$

17. Ushbu $y = x^3 + 3x^2 - 9x + 0$ Funksiyaning kamayish oralig'ini toping.

e) $[3; -1]$

f) $[-3; 1]$

g) $[- ; -3]$

h) $[1; +]$

18. Ushbu funksiyaning hosilasini toping: $f(x) = (2x - x^3)^{10}$

e) $10(2x - x^3)(2 - 3x^2)$

f) $9(2x - x^3)^9$

g) $10(2x - x^3)^9(2 - 3x^2)$

h) $10(2x - x^3)^9$

19. Quyidagi limitni hisoblang: $\lim_{x \rightarrow 0} \frac{\operatorname{tg} x - x}{x - \sin x}$

e) 3

f) 2

g) 2

h) 0,5

20. Agar $f(x) = \frac{1}{3}x^3 - 16x$ bo'lsa, $f'(4)$ ni toping.

e) 0

f) 3

g) 4

h) 5

21. $y\left(\frac{\pi}{10}\right)$ ni toping. $y = \sqrt[3]{\sin^2 5x}$

e) 0

f) 2

g) 3

h) 9

22. $y = \frac{x}{2} - \sqrt{x}$ funksiyaning $[0;16]$ kesmadagi eng katta qiymatini hisoblang.

e) 6

f) 5

g) 4

h) 2

23. Ushbu funksiyaning hosilasini toping: $f(x) = \sin(2/x)$

e) $(2/x^2) \cos(2/x)$

f) $-(2/x^2) \sin(2/x)$

g) $-(2/x) \cos(2/x^2)$

h) $-(2/x^2) \cos(2/x)$

24. $\frac{dx}{x(x^2+1)}$ ni toping.

e) $\ln|x| + \arctg x + C$

f) $\ln(x^2+1) + C$

g) $\ln \frac{|x|}{\sqrt{x^2+1}} + C$

h) $(\ln|x(x^2+1)|) + C$

25. $\frac{x^3 + 2x + 2\sqrt{x}}{x\sqrt{x}} dx$ ni hisoblang.

e) $\frac{4}{5}x^2\sqrt{x} + 4\sqrt{x} + \ln|x| + C$

f) $\frac{2}{5}x^2\sqrt{x} + 4\sqrt{x} + 2\ln|x| + C$

g) $\frac{2}{5}x^2\sqrt{x} + 4\sqrt{x} + \ln|x| + C$

h) $\frac{2}{5}x^2\sqrt{x} + 4\sqrt{x} + 2\ln|x|$

26. Funksiyaning hosilasini toping: $f(x) = 2^{\sqrt{x}}$

e) $\frac{2^{\sqrt{x}}}{2\sqrt{x}}$

f) $\sqrt{x} 2^{\sqrt{x}-1}$

g) $\frac{2^{\sqrt{x}} \ln 2}{2\sqrt{x}}$

h) $2^{\sqrt{x}} \ln 2$

27. $\vec{a}, \vec{b}, \vec{c}$ vektorlarning komplanarlik shartini ko'rsating.

e) $(\vec{a} + \vec{b}) \vec{c} = 0$

f) $(\vec{a} - \vec{b}) \vec{c} = 0$

g) $\vec{a}\vec{b}\vec{c} = 0$

h) $(\vec{a} \ \vec{b})\vec{c} = 0$

28. $\vec{a} = 4\vec{i} + 7\vec{j} + 3\vec{k}$ va $\vec{b} = 3\vec{i} - 5\vec{j} + \vec{k}$ vektorlarning skalyar ko'paytmasi quyidagiga teng.

e) $\vec{a}\vec{b} = 20$

f) $\vec{a}\vec{b} = -50$

g) $\vec{a}\vec{b} = 30$

h) $\vec{a}\vec{b} = -20$

29. $\vec{a} = \vec{i}$ va $\vec{b} = \vec{i} + \vec{j}$ vektorlar orasidagi burchak quyidagiga teng.

e) $\varphi = 90^0$

f) $\varphi = 30^0$

g) $\varphi = 0^0$

h) $\varphi = 45^0$

30. $\vec{a} = \vec{j} + \vec{k}$ va $\vec{b} = \vec{k}$ vektorlarning vektor ko'paytmasi quyidagiga teng.

e) $[\vec{a}\vec{b}] = \vec{k}$

f) $[\vec{a}\vec{b}] = \vec{j}$

g) $[\vec{a}\vec{b}] = \vec{i}$

h) $[\vec{a}\vec{b}] = \vec{j} + \vec{k}$

31. $\vec{a} = \vec{i} + 2\vec{j} + 3\vec{k}$ va $\vec{b} = \vec{j} + 2\vec{k}$, $\vec{c} = \vec{k}$ vektorlarga yasalgan parallelepipedning hajmi quyidagiga teng.

e) $V = 1$

f) $V = 6$

g) $V = 12$

h) $V = 4$

32. $M(1,2)$ nuqtadan $2x - y - \sqrt{5} = 0$ to'g'ri chiziqgacha bo'lgan masofa quyidagilardan biriga teng.

e) $d = 0$

f) $d = \sqrt{5}$

g) $d = 1$

h) $d = \frac{1}{\sqrt{5}}$

33. $3x + 4y + 1 = 0$ va $4x - 3y - 5 = 0$ to'g'ri chiziqlar orasidagi burchak quyidagilardan biriga teng.

e) $\varphi = 90^0$

f) $\varphi = 60^0$

g) $\varphi = 30^0$

h) $\varphi = 0^0$

34. $y = 3x - 5$ to'g'ri chiziqning absissasi $x_0 = -4$ ga teng bo'lgan nuqtaning ordinatasi y_0 ni toping.

e) 17

f) -4

g) -17

h) 7

35. $C(3;2)$ nuqtaga koordinata boshiga nisbatan simmetrik bo'lgan nuqtani toping.

e) $(-3;-2)$

f) $(3;2)$

g) $(3;-2)$

1. $f(z) = \frac{1}{2}\left(z + \frac{1}{z}\right)$ funksiyabir yaproqli, bo'lgan sohani toping.

e) $Imz < 0$

- f) $\{Imz > 0\}$
 g) $Imz > 0$
 h) $Rez < 0$
2. $f(z) = \frac{1}{z+2}$ funksiyabir yaproqli, bo‘lmagan sohani toping.
 e) $Rez > 3$
 f) $|z| > 2$
 g) $Imz > 0$
 h) $|z| < 2$
3. $f(z) = e^z$ funksiya bir yaproqli, bo‘lmagan sohani toping.
 e) $Imz < 0$
 f) $Imz > 0$
 g) $0 < Rez < 1$
 h) $|z| < 1$
4. $f(z) = \bar{z}^2$ funksiyaning haqiqiy va mavhum qismlarini toping.
 e) $U(x, y) = x^2 - y^2 \quad v(x, y) = -2xy$
 f) $U(x, y) = x^2 - y^2 \quad v(x, y) = 2xy$
 g) $U(x, y) = x^2 - y^2 \quad v(x, y) = 2x$
 h) $U(x, y) = x^2 \quad v(x, y) = 2xy$
5. $f(z) = |z|^2 [Rez]^2$ funksiyaning haqiqiy qismini toping.
 e) $U(x, y) = x^2 + 2xy^2$
 f) $U(x, y) = y^2$
 g) $U(x, y) = (x^2 + y^2) x^2$
 h) $U(x, y) = x^2$
6. $f(z) = 2z + 1$ funksiyaning hosilasini toping.
 e) $2y$
 f) $2z \in C$
 g) $2x$
 h) 1
7. $w = z^2$ funksiyaning $z_0 = 1$ nuqtadagi cho‘zilish koeffitsentli $R(\varphi)$ va burilish

burchagini $x(\varphi)$ ni toping.

e) $R(\varphi) = 2 \quad \alpha(\varphi) = \frac{\pi}{2}$

f) $R(\varphi) = \frac{1}{2} \quad \alpha(\varphi) = 0$

g) $R(\varphi) = 2: \alpha(\varphi) = 0$

h) $R(\varphi) = 2 \quad 2(\varphi) = \pi$

8. $U = x^2 - y^2 + x$ garmonik funksiyaga s da qo'shma garmonik funksiyani toping?

e) $v(x, y) = 2xy + y + c$

f) $U(x, y) = 2xy - y + c$

g) $v(x, y) = y - 2xy + c$

h) $v(x, y) = y + 2xy + c$

9. $U(x, y) = xy + 1$ garmonik funksiyaga s da qo'shma garmonik funksiyani toping?

e) $v(x, y) = x^2 + y^2 + c$

f) $U(x, y) = x^2 - y^2 + c$

g) $v(x, y) = -\frac{1}{2}(x^2 - y^2) + c$

h) $v(x, y) = \frac{1}{2}(x^2 - y^2) + c$

10. $v(x, y) = 3x^2y - y^3$ tenglik bilan berilgan $f(z) = U(x, y) + iv(x, y)$ holmorf funksiyani toping.

e) $f(z) = z^3 + ci$

f) $f(z) = z^2 + c$

g) $f(z) = z^2$

h) $f(z) = z^3 + c$

11. $\alpha = e^{2+i}$ moduli va argumentini topig.

e) $|\alpha| = e^2 \quad \arg \alpha = 1$

f) $|\alpha| = e^2 \quad \arg \alpha = -1$

g) $|\alpha| = e \quad \arg \alpha = 1$

h) $|\alpha| = e^{-2} \quad \arg \alpha = -1$

12. e^z ning $z = \frac{\pi}{2}i$ dagi qiymatini toping.

e) -1

f) 1

g) i

h) $-i$

13. $f(x) = \frac{1}{3}x^3 - \frac{3}{2}x^2 + 2x - 1$ funksiyaning maksimumini toping.

e) $f_{\max}(0) = -1$

f) $f_{\max}(1) = -\frac{1}{6}$

g) $f_{\max}(2) = -\frac{1}{3}$

h) maksimumi yo'q

14. $f(x) = \frac{1}{3}x^3 - \frac{3}{2}x^2 + 2x - 1$ funksiyaning minimumini toping.

e) $f_{\min}(1) = -\frac{1}{6}$

f) $f_{\min}(0) = -1$

g) $f_{\min}(2) = -\frac{1}{3}$

h) minimum yo'q

15. $\frac{dx}{2x+1}$ integralni hisoblang.

e) $\frac{1}{(2x+1)^2} + C$

f) $\sqrt{x} + C$

g) $\ln|x| + C$

h) $\frac{1}{2} \ln|2x+1| + C$

16. $(2x-1)^{10} dx$ integralni hisoblang.

e) $\frac{1}{11}(2x-1)^{11} + C$

f) $\frac{1}{22}(2x-1)^{11} + C$

g) $\frac{1}{22}(2x+1)^{11} + C$

h) $\frac{1}{11}(2x+1)^{11} + C$

17. $\operatorname{ctgx} dx$ integralni hisoblang.

e) $\operatorname{tg} x$

f) $\operatorname{ctg}^2 x + C$

g) $\ln|\sin x| + C$

h) $\ln|x| + C$

18. $\cos^2 x dx$ integralni hisoblang.

e) $x + \frac{1}{4}\sin 2x + C$

f) $\frac{1}{2}x + \sin 2x + C$

g) $\frac{1}{2}x + \frac{1}{4}\sin 2x + C$

h) $x + \sin 2x + C$

19. $\sin^2 x dx$ integralni hisoblang.

e) $x + \frac{1}{4}\cos 2x + C$

f) $x + \sin 2x + C$

g) $x + \cos 2x + C$

h) $\frac{1}{2}x - \frac{1}{4}\sin 2x + C$

20. $f(x) = x \sin x$ funksiyaning hosilasini toping.

e) $\sin x$

f) $\sin x + x \cos x$

g) $x \cos x$

h) $\cos x$

21. Ko'rsatilgan tartibdagi differensialni toping: $y = x^5$, $d^5 y = ?$

e) $d^5 y = 120 dx^5$

f) $d^5 y = 24 dx^5$

g) $d^5 y = 150 dx^5$

h) $d^5 y = 5 dx^5$

22. Funksiya grafigiga x_0 nuqtada o'tkazilgan urinma tenglamasi qaysi javobda to'g'ri berilgan.

e) $y = f(x_0) + f'(x_0)(x - x_0)$

f) $y = f(x_0) - \frac{1}{f'(x_0)}(x - x_0)$

g) $y = f(x_0) + f'(x_0)(x + x_0)$

h) $y = f(x_0) + \frac{1}{f'(x_0)}(x - x_0)$

23. Funksiya grafigiga x_0 nuqtada o'tkazilgan normal tenglamasi qaysi javobda to'g'ri berilgan.

e) $y = f(x_0) + f'(x_0)(x - x_0)$

f) $y = f(x_0) - \frac{1}{f'(x_0)}(x - x_0)$

g) $y = f(x_0) + f'(x_0)(x + x_0)$

h) $y = f(x_0) + \frac{1}{f'(x_0)}(x - x_0)$

24. Funksiya hosilasini 0-ga aylantiradigan nuqta qanday nuqta deyiladi?

e) minimum nuqta

f) maksimum nuqta

g) ekstremum nuqta

h) statsionar nuqta

25. Agar $\vec{a} = \{1; 3; -1\}$, $\vec{b} = \{2; 1; 4\}$ bo'lsa $\vec{c} = \vec{a} + \vec{b}$ ni toping.

e) $\vec{c} = \{0; 2; 1\}$

f) $\vec{c} = \{5; 0; 3\}$

g) $\vec{c} = \{2; 3; -1\}$

h) $\vec{c} = \{3; 4; 3\}$

26. $A = (3; 1; 5)$, $B = (1; 2; 2)$ bo'lsa $\overrightarrow{AB}$ vektorning koordinatalarini toping.

e) $\{0; 1; 4\}$

f) $\{1; 2; 3\}$

g) $\{-2; 1; -3\}$

h) $\{-1; 2; 3\}$

27. $\vec{a} = \{2; -1; 3\}$, $\vec{b} = \{-6; 3; -9\}$ vektorlar qanday o'zaro munosabatda bo'ladi?

e) $\vec{a}$ va $\vec{b}$ kollinear bo'ladi.

f) $\vec{a} \perp \vec{b}$

g) $\vec{a} = \vec{b}$

h) $\vec{a}$ va $\vec{b}$ kollinear emas.

28. $\vec{a} = \{-2; 0; 10\}$, $\vec{b} = \{0; -12; 0\}$, $\vec{c} = \{10; 0; 2\}$ vektorlar qanday o'zaro munosabatda bo'ladi?

e) $\vec{a}, \vec{b}, \vec{c}$ o'zaro ortogonal

f) $\vec{a}, \vec{b}, \vec{c}$ komplanar

g) $\vec{a}, \vec{b}, \vec{c}$ ortogonal

h) $\vec{a}, \vec{b}, \vec{c}$ kollinear

29. $\vec{a} = \{x_1; y_1; z_1\}$ va $\vec{b} = \{x_2; y_2; z_2\}$ vektorlarning skalyar ko'paytmasi qanday formula yordamida topiladi?

e) $\vec{a}\vec{b} = x_1^2 x_2^2 + y_1^2 y_2^2 + z_1^2 z_2^2$

f) $\vec{a}\vec{b} = (x_1 + y_1 + z_1) \cdot (x_2 + y_2 + z_2)$

g) $\vec{a} \cdot \vec{b} = \sqrt{x_1^2 + y_1^2 + z_1^2} \sqrt{x_2^2 + y_2^2 + z_2^2}$

h) $\vec{a}\vec{b} = x_1x_2 + y_1y_2 + z_1z_2$

30. Agar $xy > 0$ bo'lsa $M(x, y)$ nuqta qaysi chorakda joylashgan?

e) II va III

f) I va III

g) III va IV

h) I va IV

31. Agar $xy < 0$ bo'lsa $M(x, y)$ nuqta qaysi chorakda joylashgan?

e) III va IV

f) I va III

g) I va IV

h) II va IV

32. Ordinata o'qida $A(1; -3; 7)$ va $B(5; 7; -5)$ nuqtalardan bir xil uzoqlikdagi nuqtani toping.

e) $C(0; 2; 0)$

f) $C(0; 4; 0)$

g) $C(0; -2; 0)$

h) $C(0; -5; 0)$

33. Parallelogramm uchta uchining koordinatalari $A(3; -5)$, $B(5; -3)$, $C(-1; 3)$ berilgan, uning to'rtinchi uchi D nuqtaning koordinatalarini toping.

e) $D(-4; 1)$

f) $D(0; -1)$

g) $D(-3; 1)$

h) $D(-4; -1)$

34. $\vec{a}$ va $\vec{b}$ o'zaro perpendikulyar vektorlar bo'lib agar, $|\vec{a}| = 3$, $|\vec{b}| = 4$ bo'lsa,

$|\vec{a} + \vec{b}|$ ni toping.

e) $|\vec{a} + \vec{b}| = 1$

f) $|\vec{a} + \vec{b}| = 5$

g) $|\vec{a} + \vec{b}| = 0$

h) $|\vec{a} + \vec{b}| = 2$

35. $|\vec{a}| = 3$, $|\vec{b}| = 2$, $(\vec{a}, \vec{b}) = 120^\circ$ bo'lsa $|\vec{a} + 2\vec{b}|$ ni toping.

d) $\sqrt{13}$

e) $\sqrt{15}$

f) $\sqrt{37}$

g) $\sqrt{23}$

Fan: Kompyuter ta'minoti (DAK)

1. Kompyuter ta'minoti deganda nima tushuniladi?

- A) Faqat apparat vositalari
- B) Faqat dasturlar
- C) Apparatlar va dasturlar majmuasi
- D) Internet texnologiyalari

2. Dasturiy ta'minotning asosiy turlari qaysilar?

- A) Tizimli va amaliy
- B) Texnik va mantiqiy
- C) Fizik va virtual
- D) Lokal va global

3. Operatsion tizim qaysi turdagi dasturga kiradi?

- A) Amaliy
- B) Tizimli
- C) Ofis
- D) Grafik

4. Quyidagilardan qaysi biri operatsion tizim?

- A) MS Word
- B) Windows
- C) Excel
- D) PowerPoint

5. BIOS nima vazifani bajaradi?

- A) Internetga ulaydi
- B) Kompyuterni ishga tushiradi
- C) Matn tahrirlaydi
- D) Virusni aniqlaydi

6. Kompyuterning "miyasi" deb qaysi qurilma ataladi?

- A) Qattiq disk
- B) Operativ xotira
- C) Protssessor
- D) Videokarta

7. Operativ xotira (RAM) nima uchun kerak?
- A) Ma'lumotlarni uzoq saqlash
 - B) Hisob-kitob qilish
 - C) Vaqtinchalik ma'lumotlarni saqlash
 - D) Grafikni chiqarish
8. Qattiq disk (HDD/SSD) vazifasi nima?
- A) Hisoblash
 - B) Doimiy saqlash
 - C) Tarmoq ulash
 - D) Chop etish
9. Quyidagilardan qaysi biri kiritish qurilmasi?
- A) Monitor
 - B) Printer
 - C) Klaviatura
 - D) Kolonka
10. Chiqish qurilmasini aniqlang:
- A) Sichqoncha
 - B) Skaner
 - C) Monitor
 - D) Klaviatura
11. Drayver nima?
- A) Virus
 - B) Qurilmani boshqaruvchi dastur
 - C) Fayl menejeri
 - D) Arxivator
12. Fayl tizimi nima?
- A) Operatsion tizim turi
 - B) Ma'lumotlarni saqlash usuli
 - C) Internet protokoli
 - D) Grafik format
13. NTFS qaysi tizimga tegishli?
- A) Linux
 - B) macOS
 - C) Windows
 - D) Android
14. Linux operatsion tizimi qaysi turga kiradi?
- A) Pullik
 - B) Yopiq kodli
 - C) Ochiq kodli
 - D) Mobil
15. Kompyuter virusi nima?
- A) Qurilma
 - B) O'yin
 - C) Zararli dastur
 - D) Antivirus
16. Antivirus dastur vazifasi?
- A) Tezlikni oshirish
 - B) Viruslarni aniqlash va yo'qotish
 - C) Internetni ulash
 - D) Dastur yozish
17. Firewall nima?
- A) Grafik dastur
 - B) Tarmoq himoya tizimi

- C) Matn muharriri
- D) Arxivator
- 18. MS Excel qaysi turdagi dastur?
 - A) Grafik
 - B) Matn
 - C) Elektron jadval
 - D) Tizimli
- 19. Kompilyator nima qiladi?
 - A) Matnni o'chiradi
 - B) Dasturni mashina tiliga o'giradi
 - C) Internetga ulaydi
 - D) Virus topadi
- 20. Algoritm nima?
 - A) Qurilma
 - B) Buyruqlar ketma-ketligi
 - C) Fayl turi
 - D) Operatsion tizim
- 21. Ma'lumotlarni siqish dasturi qaysi?
 - A) WinRAR
 - B) Paint
 - C) Chrome
 - D) Word
- 22. Bulutli texnologiya misoli?
 - A) Google Drive
 - B) BIOS
 - C) HDD
 - D) CPU
- 23. IP manzil nima?
 - A) Kompyuter nomi
 - B) Tarmoqdagi noyob adres
 - C) Fayl turi
 - D) Dastur
- 24. Internet protokoli qaysi?
 - A) HTTP
 - B) RAM
 - C) CPU
 - D) PDF
- 25. ASCII nima?
 - A) Grafik format
 - B) Kodlash jadvali
 - C) Antivirus
 - D) Dastur tili
- 26. Ma'lumot o'lchov birligi?
 - A) Volt
 - B) Bit
 - C) Gerts
 - D) Vatt
- 27. 1 bayt nechta bitdan iborat?
 - A) 4
 - B) 6
 - C) 8
 - D) 16
- 28. Dasturiy ta'minot litsenziyasi nimani belgilaydi?

- A) Narxni
 - B) Foydalanish huquqini
 - C) Tezlikni
 - D) Xotirani
29. Mobil operatsion tizim?
- A) Windows XP
 - B) Linux
 - C) Android
 - D) Unix
30. Unix qaysi turdagi OT?
- A) Grafik
 - B) Tizimli
 - C) Matnli
 - D) Ko'p foydalanuvchili
31. Server nima?
- A) Oddiy kompyuter
 - B) Xizmat ko'rsatuvchi kompyuter
 - C) Printer
 - D) Router
32. Klient-server modeli nimani anglatadi?
- A) Ikki printer
 - B) Xizmat beruvchi va oluvchi tizim
 - C) Fayl turi
 - D) Dastur tili
33. SQL nima?
- A) Grafik dastur
 - B) Ma'lumotlar bazasi tili
 - C) Operatsion tizim
 - D) Antivirus
34. Ma'lumotlar bazasi nima?
- A) Fayllar to'plami
 - B) Tizimli dastur
 - C) Tartiblangan ma'lumotlar majmui
 - D) Internet sahifa
35. Brauzer nima?
- A) Antivirus
 - B) Internet ko'ruv dasturi
 - C) Grafik muharrir
 - D) Drayver
36. Google Chrome bu —
- A) Operatsion tizim
 - B) Brauzer
 - C) Antivirus
 - D) Server
37. URL nima?
- A) Fayl nomi
 - B) Internet manzili
 - C) IP turi
 - D) Dastur
38. HTTPS nimani bildiradi?
- A) Tezkor internet
 - B) Xavfsiz protokol
 - C) Grafik format

- D) Kodlash
39. Virtual mashina nima?
- A) Fizik qurilma
 - B) Dasturiy emulyator
 - C) Printer
 - D) BIOS
40. Bulutli hisoblashning afzalligi?
- A) Qimmat
 - B) Masofadan foydalanish
 - C) Faqat lokalD) Sekin ishlash
41. Kompyuter tarmog‘i nima?
- A) Bitta kompyuter
 - B) Ulangan kompyuterlar majmui
 - C) Dastur
 - D) Qurilma
42. Lokal tarmoq (LAN) —
- A) Dunyo bo‘ylab
 - B) Kichik hududda
 - C) Sun‘iy yo‘ldosh
 - D) Mobil
43. Global tarmoq misoli?
- A) LAN
 - B) WAN
 - C) Internet
 - D) Bluetooth
44. Bluetooth nima?
- A) Kabel
 - B) Simsiz aloqa texnologiyasi
 - C) Dastur
 - D) Virus
45. ZIP fayl bu —
- A) Rasm
 - B) Siqilgan fayl
 - C) Video
 - D) Tizimli
46. Dasturlash tili misoli?
- A) HTML
 - B) CPU
 - C) RAM
 - D) USB
47. USB nima?
- A) Dastur
 - B) Qurilma interfeysi
 - C) Operatsion tizim
 - D) Fayl
48. Kompyuter xavfsizligi nimani o‘rganadi?
- A) Dizayn
 - B) Himoya usullarini
 - C) O‘yinlar
 - D) Grafika
49. Zaxira nusxa (backup) nima?
- A) Virus

- B) Nusxa saqlash
 - C) O'chirish
 - D) Siqish
50. IT nimani anglatadi?
- A) Internet Texnika
 - B) Information Technology
 - C) Intelligent ToolD) Internal Transfer
51. Protsessor takt chastotasi nimani bildiradi?
- A) Xotira hajmini
 - B) Buyruqlar bajarilish tezligini
 - C) Ekran o'lchamini
 - D) Disk sig'imini
52. GHz o'lchov birligi nimaga tegishli?
- A) Xotira
 - B) Tarmoq
 - C) Protsessor tezligi
 - D) Grafik sifat
53. Ko'p yadroli protsessor afzalligi nimada?
- A) Kam xotira talab qiladi
 - B) Bir nechta vazifani parallel bajaradi
 - C) Kam energiya ishlatadi
 - D) Faqat grafik uchun
54. Cache xotira vazifasi?
- A) Ma'lumotni doimiy saqlash
 - B) Protsessor ishini tezlashtirish
 - C) Internetga ulash
 - D) Zaxira qilish
55. GPU nima?
- A) Asosiy protsessor
 - B) Grafik protsessor
 - C) Operativ xotira
 - D) Tarmoq karta
56. Videokarta nima uchun kerak?
- A) Hisoblash
 - B) Grafikni qayta ishlash
 - C) Ma'lumot saqlash
 - D) Tarmoq ulash
57. SSD va HDD farqi nimada?
- A) SSD sekinroq
 - B) HDD mexanik emas
 - C) SSD tezroq ishlaydi
 - D) HDD qimmatroq
58. Operatsion tizimning asosiy vazifasi?
- A) Dastur yozish
 - B) Resurslarni boshqarish
 - C) Internet yaratish
 - D) Grafika chizish
59. Multitasking nima?
- A) Bitta vazifa
 - B) Bir nechta vazifani ketma-ket
 - C) Bir nechta vazifani bir vaqtda
 - D) Tarmoq ishlashi

60. Process nima?
- A) Qurilma
 - B) Ishlayotgan dastur
 - C) Fayl
 - D) Drayver
61. Thread nima?
- A) Fayl turi
 - B) Eng kichik bajariluvchi oqim
 - C) Operatsion tizim
 - D) Qurilma
62. Real-time operatsion tizim qayerda ishlatiladi?
- A) Ofisda
 - B) O'yinlarda
 - C) Tibbiyot va sanoatda
 - D) Matn tahrirda
63. Embedded system nima?
- A) Server
 - B) O'rnatilgan tizim
 - C) Desktop tizim
 - D) Mobil ilova
64. Android qaysi yadro asosida?
- A) Windows NT
 - B) Linux
 - C) Unix
 - D) DOS
65. iOS operatsion tizimi qaysi qurilma uchun?
- A) Samsung
 - B) Nokia
 - C) Apple
 - D) Huawei
66. Firmware nima?
- A) Internet protokol
 - B) Qurilma ichki dasturi
 - C) Ofis dasturi
 - D) Antivirus
67. Plug and Play nimani anglatadi?
- A) Dastur yozish
 - B) Avtomatik qurilma aniqlash
 - C) Internetga ulash
 - D) Grafik chizish
68. Kompyuter porti nima?
- A) Dastur
 - B) Ulanish interfeysi
 - C) Xotira
 - D) Virus
69. HDMI nima uchun ishlatiladi?
- A) Internet
 - B) Video va audio uzatish
 - C) Printer ulash
 - D) Zaxira qilish
70. TCP/IP nima?
- A) Dastur
 - B) Tarmoq protokollari to'plami

- C) Operatsion tizimD) Qurilma
71. MAC manzil nima?
- A) Internet manzili
 - B) Qurilmaning jismoniy manzili
 - C) Fayl nomi
 - D) Dastur kodi
72. Router vazifasi?
- A) Chop etish
 - B) Tarmoqlarni bog'lash
 - C) Virus aniqlash
 - D) Grafika
73. Switch nima?
- A) Server
 - B) Tarmoq kommutatori
 - C) Operatsion tizim
 - D) Drayver
74. DNS nima vazifa bajaradi?
- A) Ma'lumot siqadi
 - B) Domenni IP ga o'giradi
 - C) Fayl saqlaydi
 - D) Internet tezlashtiradi
75. Cloud computing asosiy modeli qaysi?
- A) LAN
 - B) IaaS, PaaS, SaaS
 - C) FTP
 - D) HTTP
76. SaaS nimani anglatadi?
- A) Software as a Service
 - B) System as a Service
 - C) Storage as a System
 - D) Software and Security
77. Virtualizatsiya nimani anglatadi?
- A) Qurilmani tezlashtirish
 - B) Resurslarni mantiqiy ajratish
 - C) Internetni kuchaytirish
 - D) Virusni yo'qotish
78. Hypervisor nima?
- A) Virus
 - B) Virtual mashina boshqaruvchisi
 - C) Drayver
 - D) Brauzer
79. Ma'lumotlar xavfsizligining asosiy tamoyillari?
- A) Tezlik, dizayn, narx
 - B) Maxfiylik, butunlik, mavjudlik
 - C) Fayl, papka, disk
 - D) Internet, tarmoq, server
80. Shifrlash nima?
- A) O'chirish
 - B) Ma'lumotni yashirish
 - C) Nusxa olishD) Siqish
81. AES nima?
- A) Antivirus

- B) Shifrlash algoritmi
 - C) Fayl formati
 - D) Operatsion tizim
82. Autentifikatsiya nima?
- A) Ruxsat berish
 - B) Foydalanuvchini tekshirish
 - C) Ma'lumot saqlash
 - D) Virus aniqlash
83. Parol qaysi xavfsizlik turiga kiradi?
- A) Biometrik
 - B) Bilimga asoslangan
 - C) Qurilma
 - D) Tarmoq
84. Biometrik autentifikatsiya misoli?
- A) Parol
 - B) PIN-kod
 - C) Barmoq izi
 - D) Login
85. Zararli dastur turlari?
- A) Word, Excel
 - B) Virus, trojan, worm
 - C) BIOS, DOS
 - D) HTML, CSS
86. Trojan nima?
- A) Foydali dastur
 - B) Yashirin zararli dastur
 - C) Antivirus
 - D) Drayver
87. Phishing nima?
- A) Dastur yozish
 - B) Firibgarlik usuli
 - C) Grafik dizayn
 - D) Zaxira qilish
88. Backup qayerda saqlansa xavfsizroq?
- A) Shu kompyuterda
 - B) Internetda va tashqi diskda
 - C) RAMda
 - D) BIOSda
89. Kompyuter etikasi nimani o'rganadi?
- A) Dasturlash
 - B) Axborotdan foydalanish qoidalari
 - C) Grafika
 - D) Tarmoq
90. Litsenziyasiz dastur qanday ataladi?
- A) Freeware
 - B) Shareware
 - C) PiratD) Demo
91. Open Source dastur nimasi bilan farqlanadi?
- A) Pullik
 - B) Yopiq kodli
 - C) Manba kodi ochiq
 - D) Faqat mobil

92. Freeware nima?
- A) Sinov
 - B) Bepul foydalaniladigan
 - C) Pullik
 - D) Virus
93. Shareware dastur?
- A) Butunlay bepul
 - B) Faqat sinov uchun
 - C) Faqat server
 - D) Antivirus
94. Demo versiya nima?
- A) To'liq
 - B) Cheklangan imkoniyatli
 - C) Server
 - D) Zararli
95. Ma'lumotlar formati misoli?
- A) JPG
 - B) CPU
 - C) RAM
 - D) BIOS
96. Multimedia nima?
- A) Faqat matn
 - B) Bir nechta axborot turi
 - C) Faqat video
 - D) Faqat audio
97. Grafik format emas?
- A) PNG
 - B) JPG
 - C) MP3
 - D) GIF
98. MP3 nima?
- A) Rasm
 - B) Video
 - C) Audio format
 - D) Matn
99. Video format misoli?
- A) DOCX
 - B) XLS
 - C) MP4
 - D) TXT
100. IT sohasida "upgrade" nimani bildiradi?
- A) O'chirish
 - B) Yangilash
 - C) Nusxa olish
 - D) Virus tekshirish
101. Dasturiy injiniring nima?
- A) Kompyuter yig'ish
 - B) Dastur yaratish jarayoni
 - C) Tarmoq sozlash
 - D) Grafik dizayn
102. Dastur hayotiy sikli bosqichlari qaysi?
- A) Yozish, o'chirish
 - B) Tahlil, loyihalash, ishlab chiqish, sinov

- C) Grafik, matn
 - D) Yuklash, saqlash
103. Algoritm turlari?
- A) Chiziqli, tarmoqlanuvchi, takrorlanuvchi
 - B) Grafik, audio
 - C) Lokal, global
 - D) Fizik, mantiqiy
104. Flowchart nima?
- A) Dastur kodi
 - B) Algoritm sxemasi
 - C) Ma'lumotlar bazasi
 - D) Operatsion tizim
105. Pseudokod nima?
- A) Kompilyator
 - B) Algoritmning soddalashtirilgan yozuvi
 - C) Qurilma
 - D) Grafik fayl
106. Kompilyatsiya nima?
- A) Dasturni bajarish
 - B) Tarjima qilish
 - C) Dastur kodini mashina tiliga o'girish
 - D) Sinov
107. Interpretator nima qiladi?
- A) Kodni to'liq tarjima qiladi
 - B) Kodni qatorma-qator bajaradi
 - C) Grafik chizadi
 - D) Virus topadi
108. Qaysi til kompilyatsiyalanadi?
- A) Python
 - B) JavaScript
 - C) C++
 - D) PHP
109. Yuqori darajali dasturlash tili?
- A) Assembly
 - B) Machine code
 - C) Python
 - D) Binary
110. OOP nimani anglatadi?
- A) Online Operation Program
 - B) Object-Oriented Programming
 - C) Open Office Platform
 - D) Output Optimization Process
111. OOP ning asosiy tushunchalari?
- A) Fayl, papka
 - B) Klass, obyekt, merosxo'rlik
 - C) Bit, bayt
 - D) Protokol
112. Klass nima?
- A) Obyekt nusxasi
 - B) Obyekt shabloni
 - C) Funksiya
 - D) Fayl
113. Inkapsulyatsiya nima?

A) Ma'lumotni yashirish

B) Takrorlash

C) Tarmoqlanish

D) Meros olish

114. Polimorfizm nima?

A) Bitta shakl

B) Ko'p shakllilik

C) Yashirish

D) Ajratish

115. Merosxo'rlik nima?

A) Kodni o'chirish

B) Klassdan klassga xususiyat o'tishi

C) Funksiya chaqirish

D) O'zgaruvchi

116. Ma'lumotlar tuzilmasi nima?

A) Dastur

B) Ma'lumotni saqlash va tashkil etish usuli

C) Qurilma

D) Tarmoq

117. Massiv (array) nima?

A) Bitta element

B) Bir xil turdagi elementlar to'plami

C) Fayl

D) Klass

118. Stack qanday ishlaydi?

A) FIFO

B) LIFO

C) Tasodifiy

D) Parallel

119. Queue qanday ishlaydi?

A) LIFO

B) FIFO

C) Oxiridan

D) O'rtasidan

120. Linked list afzalligi?

A) Tez qidiruv

B) Dinamik o'lcham

C) Kam xotira

D) Grafik

121. Algoritm murakkabligi nimani bildiradi?

A) Kod uzunligi

B) Vaqt va xotira sarfi

C) Dastur tili

D) Grafik dizayn

122. Big-O nimani o'lchaydi?

A) Xotira

B) Algoritm samaradorligi

C) Fayl hajmi

D) Tarmoq tezligi

123. Ma'lumotlar bazasi modeli?

A) Grafik

B) Relatsion

C) Fizik

D) Audio

124. Jadval qayerda ishlatiladi?

A) Operatsion tizim

B) Ma'lumotlar bazasi

C) Grafik

D) Antivirus

125. Primary key nima?

A) Takrorlanadigan maydon

B) Jadvalni aniqlovchi maydon

C) Parol

D) Fayl nomi

126. SQL buyruqlari qaysi?

A) SELECT, INSERT

B) PRINT, SCAN

C) RUN, STOP

D) OPEN, CLOSE

127. SELECT buyrug'i nima qiladi?

A) O'chiradi

B) Tanlab oladi

C) Qo'shadi

D) Yangilaydi

128. Normalizatsiya nima?

A) Jadvalni buzish

B) Ma'lumotni tartiblash

C) Takrorlanishni kamaytirish

D) Grafik chizish

129. NoSQL nimasi bilan farq qiladi?

A) Jadvalsiz

B) Faqat matn

C) Grafik

D) Sekin

130. DBMS nima?

A) Dastur tili

B) Ma'lumotlar bazasini boshqarish tizimi

C) Operatsion tizimD) Qurilma

131. MySQL bu —

A) Dasturlash tili

B) DBMS

C) Operatsion tizim

D) Brauzer

132. PostgreSQL qaysi tur?

A) NoSQL

B) Relatsion DBMS

C) Grafik

D) Mobil

133. Backend nima?

A) Dizayn

B) Server tomoni

C) Frontend

D) Grafik

134. Frontend nima?

A) Server

- B) Foydalanuvchi interfeysi
 - C) Ma'lumotlar bazasi
 - D) API
135. API nima?
- A) Grafik format
 - B) Dasturlararo interfeys
 - C) Operatsion tizim
 - D) Virus
136. REST nimani anglatadi?
- A) Tarmoq kabeli
 - B) Arxitektura uslubi
 - C) Dastur tili
 - D) Qurilma
137. JSON nima?
- A) Ma'lumot almashish formati
 - B) Grafik
 - C) Video
 - D) Dastur
138. XML nimasi bilan o'xshash?
- A) Video
 - B) JSON
 - C) Audio
 - D) Grafik
139. HTML nima?
- A) Dastur tili
 - B) Belgilash tili
 - C) DBMS
 - D) Operatsion tizim
140. CSS vazifasi?
- A) Mantiq
 - B) Dizayn va bezash
 - C) Ma'lumot saqlash
 - D) Server
141. JavaScript qayerda ishlaydi?
- A) Faqat serverda
 - B) Faqat kompyuterda
 - C) Brauzerda
 - D) BIOSda
142. Framework nima?
- A) Qurilma
 - B) Dastur yaratish muhiti
 - C) Operatsion tizim
 - D) Virus
143. React bu —
- A) DBMS
 - B) JavaScript kutubxonasi
 - C) Operatsion tizim
 - D) Antivirus
144. Version control nima?
- A) Dastur sinovi
 - B) Kod versiyalarini boshqarish
 - C) Grafik dizayn
 - D) Xotira

145. Git nima?

- A) Brauzer
- B) Versiyalarni boshqarish tizimi
- C) Antivirus
- D) Server

146. GitHub nima?

- A) Operatsion tizim
- B) Kod saqlash platformasi
- C) Grafik muharrir
- D) Dastur tili

147. Agile metodologiyasi nimaga asoslanadi?

- A) Qat'iy reja
- B) Moslashuvchanlik
- C) Grafik
- D) Texnik qurilma

148. Scrum nima?

- A) Tarmoq protokoli
- B) Agile metod
- C) Dastur tili
- D) Antivirus

149. Testlash nima?

- A) Dastur yozish
- B) Xatolarni aniqlash
- C) Dizayn
- D) Yuklash

150. Debugging nima?

- A) Dastur o'chirish
- B) Xatolarni tuzatish
- C) Virus aniqlash
- D) Ma'lumot saqlash

151. Unit testing nima?

- A) Tizimni to'liq tekshirish
- B) Alohida modulni tekshirish
- C) Foydalanuvchini tekshirish
- D) Tarmoqni sinash

152. Integration testing nima?

- A) Alohida funksiya
- B) Modullar o'zaro ishlashini tekshirish
- C) Dizayn sinovi
- D) Xotira tekshiruvi

153. System testing nimani tekshiradi?

- A) Faqat kod
- B) Butun tizimni
- C) Faqat interfeys
- D) Tarmoq

154. Acceptance testing kim tomonidan amalga oshiriladi?

- A) Dasturchi
- B) Foydalanuvchi
- C) Server
- D) Kompilyator

155. Black-box testing nimani bildiradi?

- A) Kodni bilib testlash
- B) Ichki tuzilmani bilmasdan testlash

- C) Faqat dizayn
 - D) Xotira
156. White-box testing nimaga asoslanadi?
- A) Interfeysga
 - B) Kod tuzilishiga
 - C) Dizaynga
 - D) Tarmoqga
157. Test case nima?
- A) Xato
 - B) Sinov holati
 - C) Dastur
 - D) Fayl
158. Bug nima?
- A) Funksiya
 - B) Xato
 - C) Dastur
 - D) Qurilma
159. Release nima?
- A) Dastur yozish
 - B) Dastur chiqarish
 - C) O'chirish
 - D) Nusxa olish
160. Deployment nimani anglatadi?
- A) Testlash
 - B) Ishga tushirish
 - C) Kod yozish
 - D) Dizayn
161. DevOps nimani birlashtiradi?
- A) Dizayn va grafik
 - B) Development va Operations
 - C) Server va tarmoq
 - D) Hardware va software
162. CI nimani anglatadi?
- A) Continuous Integration
 - B) Central Internet
 - C) Computer Interface
 - D) Code Installation
163. CD nimani anglatadi?
- A) Code Design
 - B) Continuous Delivery/Deployment
 - C) Central Data
 - D) Computer Disk
164. Docker nima?
- A) Operatsion tizim
 - B) Konteynerlash platformasi
 - C) DBMS
 - D) Brauzer
165. Container nimani anglatadi?
- A) Virtual mashina
 - B) Izolyatsiyalangan muhit
 - C) Server
 - D) Disk
166. Kubernetes vazifasi?

- A) Kod yozish
- B) Konteynerlarni boshqarish
- C) Grafik dizayn
- D) Antivirus

167. Microservices arxitekturasini nima?

- A) Monolit tizim
- B) Mustaqil kichik xizmatlar
- C) Faqat frontend
- D) Faqat backend

168. Monolit arxitektura nimasi bilan farq qiladi?

- A) Kichik xizmatlar
- B) Bitta katta tizim
- C) Server yo'q
- D) Faqat API

169. Load balancing nima?

- A) Xotira tozalash
- B) Yukni taqsimlash
- C) Grafik
- D) Zaxira

170. Scalability nimani bildiradi?

- A) Dizayn
- B) Kengayish imkoniyati
- C) TezlikD) Xavfsizlik

171. Horizontal scaling nima?

- A) Kuchli server
- B) Yangi server qo'shish
- C) CPU almashtirish
- D) Diskni kengaytirish

172. Vertical scaling nima?

- A) Server soni
- B) Resurslarni oshirish
- C) Tarmoq
- D) Dizayn

173. High availability nimani bildiradi?

- A) Sekin ishlash
- B) Doimiy ishlash
- C) Kam foydalanuvchi
- D) Grafik

174. Fault tolerance nima?

- A) Xatoni tuzatish
- B) Nosozlikka chidamlilik
- C) Testlash
- D) Kod yozish

175. Monitoring nima?

- A) Dastur yozish
- B) Tizim holatini kuzatish
- C) Grafik
- D) Virus aniqlash

176. Logging nima?

- A) Xato tuzatish
- B) Hodisalarni yozib borish
- C) Testlash

D) Zaxira

177. SLA nimani anglatadi?

A) Software License Agreement

B) Service Level Agreement

C) System Logic Access

D) Server Load Analysis

178. Uptime nima?

A) O'chirilgan vaqt

B) Ishlash vaqti

C) Test vaqti

D) Xato vaqti

179. Downtime nima?

A) Ishlash

B) To'xtab turish

C) Test

D) Dizayn

180. Performance testing nima?

A) Dizayn

B) Tezlik va yukni sinash

C) Xavfsizlik

D) Interfeys

181. Stress testing nimani aniqlaydi?

A) Normal holat

B) Chegaraviy yuk

C) Dizayn

D) Funksiya

182. Security testing nimaga qaratilgan?

A) Tezlik

B) Xavfsizlik zaifliklari

C) Dizayn

D) Grafik

183. Penetration testing nima?

A) Dizayn sinovi

B) Xakerlik simulyatsiyasi

C) Grafik

D) Zaxira

184. Vulnerability nima?

A) Kuch

B) Zaiflik

C) Server

D) Protokol

185. Patch nima?

A) Virus

B) Tuzatish yangilanishi

C) Qurilma

D) Dastur tili

186. Update va Upgrade farqi?

A) Farqi yo'q

B) Upgrade katta yangilanish

C) Update o'chirish

D) Upgrade bepul

187. License compliance nimani bildiradi?

A) Tezlik

B) Litsenziyaga rioya

C) Dizayn

D) Tarmoq

188. Data integrity nima?

A) Maxfiylik

B) Ma'lumotning buzilmasligi

C) Mavjudlik

D) Zaxira

189. Data confidentiality nima?

A) Ochiqlik

B) Maxfiylik

C) Tezlik

D) Grafik

190. Data availability nimani anglatadi?

A) Tezlik

B) Kerak paytda mavjudlik

C) DizaynD) Zaxira

191. RAID nima?

A) Antivirus

B) Disklarni birlashtirish texnologiyasi

C) Tarmoq

D) DBMS

192. RAID 1 nimani anglatadi?

A) Tezlik

B) Nusxalash (mirroring)

C) Paritet

D) Arxiv

193. RAID 0 nimani beradi?

A) Xavfsizlik

B) Tezlik

C) Zaxira

D) Shifrlash

194. Backup strategiyasi nima?

A) Dizayn

B) Nusxa olish rejasi

C) Tarmoq

D) Test

195. Full backup nima?

A) Qisman nusxa

B) To'liq nusxa

C) Faqat yangi fayl

D) Siqilgan

196. Incremental backup nima?

A) To'liq

B) Oxirgi o'zgarishlar

C) O'chirish

D) Zaxira yo'q

197. Disaster recovery nimani bildiradi?

A) Virus

B) Favqulodda tiklash

C) Testlash

D) Dizayn

198. RTO nimani anglatadi?
- A) Recovery Time Objective
 - B) Real Time Operation
 - C) Remote Task Order
 - D) Resource Transfer Option
199. RPO nimani anglatadi?
- A) Recovery Point Objective
 - B) Real Program Output
 - C) Resource Policy Object
 - D) Random Process Order
200. Business continuity nimani anglatadi?
- A) Faqat xaxira
 - B) Ish faoliyatini uzluksiz davom ettirish
 - C) TestlashD) Dizayn
201. Axborot tizimi nima?
- A) Faqat dastur
 - B) Axborotni yig'ish, saqlash va qayta ishlash tizimi
 - C) Qurilma
 - D) Internet
202. Axborot tizimi komponentlari qaysilar?
- A) Faqat kompyuter
 - B) Odamlar, jarayonlar, texnologiyalar
 - C) Faqat dastur
 - D) Faqat tarmoq
203. MIS nimani anglatadi?
- A) Management Information System
 - B) Machine Interface System
 - C) Modern Internet Software
 - D) Mobile Information Storage
204. DSS nima?
- A) Dizayn tizimi
 - B) Qaror qabul qilishni qo'llab-quvvatlash tizimi
 - C) Antivirus
 - D) Grafik muharrir
205. ERP tizimi nimani qamrab oladi?
- A) Faqat buxgalteriya
 - B) Korxona resurslarini boshqarish
 - C) Grafik dizayn
 - D) Internet xizmatlari
206. CRM nimani anglatadi?
- A) Customer Relationship Management
 - B) Central Resource Manager
 - C) Computer Record Module
 - D) Cloud Resource Model
207. SCM nima?
- A) Supply Chain Management
 - B) Software Control Module
 - C) System Core Manager
 - D) Security Control Mechanism
208. E-government nima?
- A) Internet do'koni
 - B) Elektron hukumat tizimi

- C) Antivirus
 - D) Tarmoq protokoli
209. Elektron hujjat aylanishi nimani bildiradi?
- A) Qog'ozsiz hujjatlar
 - B) Grafik dizayn
 - C) Internet tezligi
 - D) Dastur yozish
210. Big Data nimani anglatadi?
- A) Kichik ma'lumotlar
 - B) Katta hajmdagi ma'lumotlar
 - C) Grafik fayl
 - D) Video
211. Big Data xususiyatlari?
- A) 3V: Volume, Velocity, Variety
 - B) Grafik, audio
 - C) RAM, CPU
 - D) LAN, WAN
212. Data mining nima?
- A) Ma'lumot o'chirish
 - B) Ma'lumotlardan bilim olish
 - C) Zaxira
 - D) Test
213. Machine Learning nimaga asoslanadi?
- A) Qat'iy qoidalar
 - B) Ma'lumotlardan o'rganish
 - C) Grafik dizayn
 - D) Internet
214. Artificial Intelligence nimani anglatadi?
- A) Sun'iy intellekt
 - B) Antivirus
 - C) Grafik
 - D) Server
215. Neural network nima?
- A) Tarmoq kabeli
 - B) Sun'iy neyronlar modeli
 - C) Operatsion tizim
 - D) DBMS
216. Deep learning nimasi bilan farq qiladi?
- A) Kam qatlamli
 - B) Ko'p qatlamli neyron tarmoq
 - C) Grafik
 - D) Tarmoq
217. IoT nimani anglatadi?
- A) Internet of Things
 - B) Input Output Tool
 - C) Internal Operation Tech
 - D) Intelligent Office Tool
218. IoT qurilmalari misoli?
- A) Printer
 - B) Aqlli sensorlar
 - C) Server
 - D) Monitor
219. Smart city nimaga asoslanadi?

- A) Qog‘oz hujjatlar
 - B) Axborot texnologiyalari
 - C) Faqat yo‘llar
 - D) Faqat bino
220. Blockchain nima?
- A) Grafik format
 - B) Tarqatilgan reyestr texnologiyasi
 - C) AntivirusD) Operatsion tizim
221. Kriptoalyuta nimaga asoslanadi?
- A) Internet tezligi
 - B) Blockchain
 - C) Grafik
 - D) Server
222. Smart contract nima?
- A) Qog‘oz shartnoma
 - B) Avtomatik bajariladigan shartnoma
 - C) Antivirus
 - D) Grafik
223. FinTech nimani anglatadi?
- A) Financial Technology
 - B) Final Technique
 - C) File Network Tech
 - D) Finance Terminal
224. E-commerce nima?
- A) Elektron savdo
 - B) Grafik dizayn
 - C) Antivirus
 - D) Tarmoq
225. Online banking nimani bildiradi?
- A) Naqd pul
 - B) Internet orqali bank xizmatlari
 - C) Grafik
 - D) Server
226. Digital signature nima?
- A) Oddiy imzo
 - B) Elektron raqamli imzo
 - C) Grafik
 - D) Parol
227. PKI nima?
- A) Public Key Infrastructure
 - B) Private Key Internet
 - C) Personal Knowledge Index
 - D) Program Kernel Interface
228. Two-factor authentication nima?
- A) Bitta parol
 - B) Ikki bosqichli tekshiruv
 - C) Antivirus
 - D) Grafik
229. CAPTCHA nima?
- A) Grafik dizayn
 - B) Botdan himoya
 - C) Virus

D) Server

230. Social engineering nima?

A) Dastur yozish

B) Inson omiliga asoslangan hujum

C) GrafikD) Server

231. Spam nima?

A) Foydali xabar

B) Keraksiz xabar

C) Grafik

D) Server

232. Malware umumiy atamasi nimani bildiradi?

A) Foydali dastur

B) Zararli dastur

C) Tizimli dastur

D) Grafik

233. Ransomware nima?

A) Antivirus

B) Ma'lumotni qulflovchi zararli dastur

C) Grafik

D) Tarmoq

234. Spyware nima?

A) O'yin

B) Kuzatuvchi zararli dastur

C) Antivirus

D) Server

235. Adware nima?

A) Reklama ko'rsatuvchi dastur

B) Antivirus

C) Server

D) Grafik

236. Phishing qaysi tur hujum?

A) Texnik

B) Ijtimoiy muhandislik

C) Fizik

D) Grafik

237. Zero-day vulnerability nima?

A) Tuzatilgan xato

B) Oldindan noma'lum zaiflik

C) Grafik

D) Server

238. IDS nima?

A) Intrusion Detection System

B) Internet Data Storage

C) Internal Design System

D) Input Device Service

239. IPS nima?

A) Internet Provider Service

B) Intrusion Prevention System

C) Image Processing Software

D) Internal Program System

240. SIEM nima?

A) Security Information and Event Management

- B) System Internet Email Manager
C) Software Installation Engine ModuleD) Server Interface Execution Mode
241. Ethical hacking nima?
A) Noqonuniy hujum
B) Ruxsat bilan testlash
C) Virus yozish
D) Grafik
242. Bug bounty nima?
A) Jarima
B) Xato topganlik uchun mukofot
C) Antivirus
D) Server
243. Cybersecurity nimani o'rganadi?
A) Grafik dizayn
B) Axborot xavfsizligi
C) Internet tezligi
D) Server yig'ish
244. Data breach nima?
A) Ma'lumot o'chirish
B) Ma'lumot sizib chiqishi
C) Grafik
D) Test
245. GDPR nima?
A) Grafik format
B) Ma'lumotlarni himoya qilish qoidasi
C) Antivirus
D) Tarmoq
246. ISO/IEC 27001 nimaga tegishli?
A) Grafik
B) Axborot xavfsizligi standarti
C) Dastur tili
D) Internet
247. Risk assessment nima?
A) Dizayn
B) Xavfni baholash
C) Test
D) Grafik
248. Threat modeling nima?
A) Grafik
B) Tahdidlarni aniqlash
C) Zaxira
D) Dizayn
249. Compliance nimani anglatadi?
A) Tezlik
B) Talablarga rioya qilish
C) Grafik
D) Tarmoq
250. Audit nima?
A) Grafik dizayn
B) Tekshiruv
C) Dastur yozishD) Server
251. Axborot texnologiyalarining asosiy maqsadi?

- A) O'yin yaratish
 - B) Axborotni samarali qayta ishlash
 - C) Grafik chizish
 - D) Internet tezlashtirish
252. Informatika nimani o'rganadi?
- A) Texnikani
 - B) Axborot va uni qayta ishlash
 - C) Faqat dasturlar
 - D) Internetni
253. Kompyuter arxitekturasini nimani o'rganadi?
- A) Dizayn
 - B) Kompyuter tuzilishini
 - C) Dasturlash
 - D) Tarmoq
254. Von Neyman arxitekturasini asosiy qismlari?
- A) CPU, xotira, I/O
 - B) Faqat CPU
 - C) Faqat xotira
 - D) Internet
255. Harvard arxitekturasini nima bilan farq qiladi?
- A) Internet tezligi
 - B) Buyruq va ma'lumot xotirasi alohida
 - C) Grafik kuchli
 - D) Server yo'q
256. Parallel hisoblash nima?
- A) Ketma-ket ishlash
 - B) Bir vaqtda bir nechta hisoblash
 - C) Sekin ishlash
 - D) Xatolik
257. Distributed system nima?
- A) Bitta kompyuter
 - B) Taqsimlangan tizim
 - C) Lokal dastur
 - D) Grafik
258. Cluster nima?
- A) Antivirus
 - B) Birgalikda ishlovchi kompyuterlar
 - C) Grafik karta
 - D) Disk
259. Grid computing nimaga asoslanadi?
- A) Bitta server
 - B) Taqsimlangan resurslar
 - C) Grafik
 - D) Mobil
260. Edge computing nima?
- A) Markaziy server
 - B) Ma'lumotni manbaga yaqin qayta ishlash
 - C) GrafikD) Test
261. Fog computing nimasi bilan farq qiladi?
- A) Internet yo'q
 - B) Bulut va edge orasida
 - C) Grafik

D) Antivirus

262. Green IT nimani anglatadi?

A) Tezlik

B) Ekologik IT

C) Grafik

D) Tarmoq

263. Energy-efficient computing nima?

A) Sekin ishlash

B) Kam energiya sarfi

C) Grafik

D) Xavfsizlik

264. Accessibility nimani bildiradi?

A) Tezlik

B) Nogironlar uchun qulaylik

C) Grafik

D) Server

265. Usability nimani anglatadi?

A) Xavfsizlik

B) Foydalanish qulayligi

C) Grafik

D) Tarmoq

266. UX nimani anglatadi?

A) User Experience

B) Universal XML

C) Unix Extension

D) User Execution

267. UI nimani anglatadi?

A) User Interface

B) Universal Internet

C) Unit Index

D) User Integration

268. HCI nima?

A) Human-Computer Interaction

B) High Computer Internet

C) Hardware Control Interface

D) Hybrid Cloud Infrastructure

269. Responsive design nima?

A) Server dizayni

B) Moslashuvchan interfeys

C) Grafik

D) Antivirus

270. Cross-platform dastur nima?

A) Faqat Windows

B) Bir nechta platformada ishlaydi

C) Faqat mobilD) Grafik

271. Native ilova nima?

A) Brauzer

B) Platformaga mos yozilgan ilova

C) Grafik

D) Server

272. Web application nima?

A) Desktop dastur

- B) Brauzer orqali ishlovchi ilova
 - C) Antivirus
 - D) Grafik
273. Progressive Web App nima?
- A) Oddiy sayt
 - B) Web va mobil xususiyatli ilova
 - C) Grafik
 - D) Server
274. API gateway nima?
- A) Grafik
 - B) APIlarni boshqarish nuqtasi
 - C) Antivirus
 - D) Disk
275. Middleware nima?
- A) Qurilma
 - B) Dasturlar orasidagi qatlam
 - C) Grafik
 - D) Server
276. Message queue nima?
- A) Grafik
 - B) Xabarlar navbati
 - C) Antivirus
 - D) Disk
277. RabbitMQ nima?
- A) DBMS
 - B) Xabarlar brokeri
 - C) Operatsion tizim
 - D) Grafik
278. Kafka nima?
- A) Brauzer
 - B) Distributed streaming platform
 - C) Antivirus
 - D) Grafik
279. Event-driven architecture nima?
- A) Ketma-ket
 - B) Hodisalarga asoslangan
 - C) Grafik
 - D) Server
280. Serverless computing nima?
- A) Serversiz
 - B) Server boshqaruvisiz model
 - C) GrafikD) Disk
281. Function as a Service (FaaS) nimani anglatadi?
- A) Grafik
 - B) Funksiyalar asosida xizmat
 - C) Disk
 - D) Antivirus
282. AWS nima?
- A) Antivirus
 - B) Amazon Web Services
 - C) Grafik
 - D) DBMS

283. Azure nima?

- A) Brauzer
- B) Microsoft bulut platformasi
- C) Grafik
- D) Disk

284. Google Cloud nimaga xizmat qiladi?

- A) Grafik
- B) Bulutli xizmatlar
- C) Antivirus
- D) Tarmoq

285. Cloud deployment modellari?

- A) Public, Private, Hybrid
- B) LAN, WAN
- C) FTP, HTTP
- D) CPU, RAM

286. Private cloud nimasi bilan farq qiladi?

- A) Hamma uchun
- B) Bitta tashkilot uchun
- C) Grafik
- D) Sekin

287. Hybrid cloud nima?

- A) Faqat lokal
- B) Public va Private aralash
- C) Grafik
- D) Antivirus

288. Cloud security nimani o'rganadi?

- A) Dizayn
- B) Bulut xavfsizligi
- C) Grafik
- D) Test

289. Data encryption qachon qo'llaniladi?

- A) Faqat saqlashda
- B) Saqlash va uzatishda
- C) Grafikda
- D) Testda

290. Key management nima?

- A) Parol yozish
- B) Kalitlarni boshqarish
- C) Grafik
- D) Server

291. Digital forensics nima?

- A) Grafik dizayn
- B) Raqamli dalillarni tahlil qilish
- C) Antivirus
- D) Server

292. Log analysis nima?

- A) Dizayn
- B) Jurnal yozuvlarini tahlil qilish
- C) Grafik
- D) Test

293. Incident response nimani anglatadi?

- A) Grafik
- B) Hodisaga javob berish

- C) Test
 - D) Dizayn
294. SOC nimani anglatadi?
- A) System Operation Center
 - B) Security Operations Center
 - C) Software Output Control
 - D) Server Online Cloud
295. Cyber attack turlari?
- A) DDoS
 - B) Phishing
 - C) Malware
 - D) Barchasi
296. DDoS hujum nima?
- A) Grafik
 - B) Xizmatni ishdan chiqarish hujumi
 - C) Antivirus
 - D) Disk
297. Ethical IT nimani anglatadi?
- A) Tezlik
 - B) Axloqiy foydalanish
 - C) Grafik
 - D) Tarmoq
298. Intellectual property nima?
- A) Qurilma
 - B) Intellektual mulk
 - C) Grafik
 - D) Internet
299. Copyright nimani bildiradi?
- A) Ochiq kod
 - B) Mualliflik huquqi
 - C) Grafik
 - D) Tarmoq
300. IT mutaxassisining asosiy vazifasi?
- A) Faqat kod yozish
 - B) Texnologiyalar orqali muammoni hal qilish
 - C) Grafik
 - D) Internet