



MATEMATIKA

II QISM

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Sh. Jumayev, B. Ro‘ziyev
Sh. Safoyev, O. Asatov, A. Turg‘unov

MATEMATIKA

II qism

Abituriyentlar uchun

Qayta ishlangan va to‘ldirilgan ikkinchi nashri

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Taklif va mulohazalaringizni quyidagi QR kod orqali kutib qolamiz.



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7. Parametrlı tenglama va tengsizliklar

- 1 $x^2 + ax + 4 = 0$ tenglamaning ildizlaridan biri 4 ga teng bo'lsa, uning ikkinchi ildizini toping.
- 2 $x^2 - bx + 12 = 0$ tenglamaning ildizlaridan biri 3 ga teng bo'lsa, uning ikkinchi ildizini toping.
- 3 $x^2 - 2ax - 15 = 0$ tenglamaning ildizlaridan biri -3 ga teng bo'lsa, uning ikkinchi ildizini toping.
- 4 $x^2 + 4ax + 5 = 0$ tenglamaning ildizlaridan biri 7 ga teng bo'lsa, uning ikkinchi ildizini toping.
- 5 a ning qanday qiymatida $x^2 + 3x - a = 0$ tenglamaning ildizlaridan biri 2 ga teng bo'ladi?
- 6 b ning qanday qiymatida $3x^2 - 5x + 6b = 0$ tenglamaning ildizlaridan biri -3 ga teng bo'ladi?
- 7 b ning qanday qiymatida $-3x^2 + 4x + 2b = 0$ tenglamaning ildizlaridan biri 2 ga teng bo'ladi?
- 8 a va b ning qanday qiymatida $x^2 + ax - b = 0$ tenglamaning x_1 va x_2 ildizlari uchun
$$\begin{cases} x_1 - x_2 = 5 \\ 3x_1 + x_2 = -1 \end{cases}$$
 tengliklar o'rinli bo'ladi?
- 9 $x^2 - ax + b = 0$ tenglamaning x_1 va x_2 ildizlari uchun
$$\begin{cases} 2x_1 + x_2 = 8 \\ 3x_1 - 2x_2 = 5 \end{cases}$$
 tengliklar o'rinli bo'lsa, $2a - b$ ning qiymatini toping.
- 10 $-2x^2 - a(x - 1) + b = 0$ tenglamaning x_1 va x_2 ildizlari uchun
$$\begin{cases} 3x_1 + 2x_2 = 7 \\ 3x_1 - 2x_2 = -1 \end{cases}$$
 tengliklar o'rinli bo'lsa, $a + 3b$ ning qiymatini toping.

7. PARAMETRLI TENGLAMA VA TENGSIZLIKLAR

- 11 $x^2 - ax + b = 0$ tenglamaning x_1 va x_2 ildizlari uchun $\begin{cases} 2x_1 + 5x_2 = 8 \\ 4x_1 - x_2 = -6 \end{cases}$ tengliklar o'rinli bo'lsa, $3a + b$ ning qiymatini toping.
- 12 b ning qanday qiymatida $x^2 - 3x + b = 0$ tenglamaning x_1 va x_2 ildizlari uchun $x_1 + 3x_2 = 7$ tenglik o'rinli bo'ladi?
- 13 a ning qanday qiymatida $-x^2 + 4x + a = 0$ tenglamaning x_1 va x_2 ildizlari uchun $2x_1 + x_2 = 7$ tenglik o'rinli bo'ladi?
- 14 a ning qanday qiymatida $x^2 + 7x - a = 0$ tenglamaning x_1 va x_2 ildizlari uchun $2x_1 - 3x_2 = 1$ tenglik o'rinli bo'ladi?
- 15 a ning qanday qiymatida $-2x^2 - 6x - a = 0$ tenglamaning x_1 va x_2 ildizlari uchun $x_1 - 3x_2 = 5$ tenglik o'rinli bo'ladi?
- 16 b ning qanday qiymatida $x^2 + 4x - b = 0$ tenglamaning ildizlaridan biri ikkinchisidan 2 ga ortiq bo'ladi?
- 17 a ning qanday qiymatida $x^2 + 7x + a = 0$ tenglamaning ildizlaridan biri ikkinchisidan 1 ta ortiq bo'ladi?
- 18 a ning qanday qiymatida $-x^2 - 6x - a = 0$ tenglamaning ildizlaridan biri ikkinchisidan 2 ga katta bo'ladi?

7. PARAMETRLI TENGLAMA VA TENGSIZLIKLAR

- 19 c ning qanday qiymatida $2x^2 + 4x - c = 0$ tenglama ildizlarining ayirmasi 6 ga teng bo'ladi?
- 20 c ning qanday qiymatida $x^2 + 10x + c = 0$ tenglama ildizlarining nisbati 4 ga teng bo'ladi?
- 21 a ning qanday qiymatida $x^2 + 4x - a = 0$ tenglama ildizlarining nisbati 3 ga teng bo'ladi?
- 22 b ning qanday qiymatida $2x^2 + 18x - b = 0$ tenglama ildizlarining nisbati 2 ga teng bo'ladi?
- 23 b ning qanday qiymatida $4x^2 - 4x + b = 0$ tenglama ildizlarining nisbati -2 ga teng bo'ladi?
- 24 d ning qanday qiymatida $3x^2 + 9x - d = 0$ tenglama ildizlarining nisbati 2 ga teng bo'ladi?
- 25 a ning qanday qiymatida $x^2 + 3x - a = 0$ tenglama ildizlarining kvadratlarining yig'indisi 5 ga teng bo'ladi?
- 26 a ning qanday qiymatida $-x^2 + ax - 6 = 0$ tenglama ildizlari kvadratlarining yig'indisi 13 ga teng bo'ladi?

7. PARAMETRLI TENGLAMA VA TENGSIZLIKLAR

- 27 c ning qanday qiymatida $x^2 - 9x + c = 0$ tenglama ildizlari kvadratlarining yig'indisi 101 ga teng bo'ladi?
- 28 a ning qanday qiymatida $-x^2 + ax + 12 = 0$ tenglama ildizlari kvadratlarining yig'indisi 25 ga teng bo'ladi?
- 29 a ning qanday qiymatida $2x^2 + ax - 14 = 0$ tenglama ildizlari kvadratlarining yig'indisi 50 ga teng bo'ladi?
- 30 a ning qanday qiymatida $x^2 + 3x - a = 0$ tenglama ildizlari kublarining yig'indisi -9 bo'ladi?
- 31 b ning qanday qiymatida $x^2 - 7x + b = 0$ tenglama ildizlari kublarining yig'indisi 91 ga teng bo'ladi?
- 32 c ning qanday qiymatida $-x^2 + 3x + c = 0$ tenglama ildizlari kublarining yig'indisi 63 ga teng bo'ladi?
- 33 a ning qanday qiymatida $x^2 + 6x + a = 0$ tenglama ildizlari kublarining yig'indisi -126 ga teng bo'ladi?

7. PARAMETRLI TENGLAMA VA TENGSIZLIKLAR

- 34** a ning qanday qiymatida $2x^2 + 6x + a = 0$ tenglama ildizlari kublarining yig'indisi -63 ga teng bo'ladi?
- 35** a ning qanday qiymatida $x^2 + (7a+2)x + a^2 - 3a + 2 = 0$ tenglama ildizlari ko'paytmasi 0 ga teng bo'ladi?
- 36** a ning qanday qiymatida $x^2 + (a^2 + 3a - 4)x + a = 0$ tenglamaning ildizlari qarama-qarshi sonlar bo'ladi?
- 37** a ning qanday qiymatida $3x^2 + (a^2 - 2, 5)x + 9 = 0$ tenglama ildizlarining nisbati 12 bo'ladi?
- 38** a ning qanday qiymatida $x^2 + 2x + a^2 - 7 = 0$ tenglama ildizlarining farqi 4 ga teng bo'ladi?
- 39** c ning qanday qiymatida $x^2 + (c+1)x - 3 - c^2 = 0$ tenglama ildizlari kvadratlarining yig'indisi 40 ga teng bo'ladi?
- 40** a ning qanday qiymatida $x^2 + (2a + 1)x + a^2 + 4 = 0$ tenglama ildizlari kvadratlarining yig'indisi 41 ga teng bo'ladi?
- 41** k ning qanday qiymatlarida $(k^2 - 3k - 4)x = k^2 - 9$ tenglamaning ildizi manfiy bo'ladi?

7. PARAMETRLI TENGLAMA VA TENGSIZLIKLAR

42 k ning qanday qiymatlarida $(k^2 - 25)x = (k - 4)^2$ tenglamaning ildizi manfiy bo'ladi?

46 a ning qanday qiymatlarida $ax - 3a = 4$ tenglama ildizi 2 dan katta bo'ladi?

43 a ning qanday qiymatlarida $\frac{3x - 2}{x - 1} = a$ tenglamaning ildizi musbat bo'ladi?

47 a ning qanday qiymatlarida $ax + 4a = 10$ tenglamaning ildizi 1 dan kichik bo'ladi?

44 a ning qanday qiymatlarida $\frac{x - 4}{2x + 1} = a + 1$ tenglamaning ildizi manfiy bo'ladi?

48 b ning qanday qiymatlarida $b(4 - x) = 6$ tenglamaning ildizi manfiy bo'ladi?

45 a ning qanday qiymatlarida $\frac{x + 3}{4 - x} = a - 2$ tenglamaning ildizi musbat bo'ladi?

49 b ning qanday qiymatlarida $b(2 + x) = 6$ tenglamaning ildizi 1 dan katta bo'ladi?

7. PARAMETRLI TENGLAMA VA TENGSIZLIKLAR

- 50 p ning qanday qiymatlarida $x^2 + px + 16 = 0$ tenglama haqiqiy yechimga ega bo'lmaydi?
- 51 a ning qanday qiymatlarida $4x^2 + ax + 9 = 0$ tenglama haqiqiy yechimga ega bo'lmaydi?
- 52 k ning qanday qiymatlarida $x^2 - kx + k + 3 = 0$ tenglama haqiqiy yechimga ega bo'lmaydi?
- 53 k ning qanday qiymatlarida $x^2 - 2(k+2)x + 20 - k^2 = 0$ tenglama 2 ta haqiqiy ildizga ega bo'ladi?
- 54 a ning qanday qiymatlarida $x^2 + 3ax + a^2 - 4 = 0$ tenglama turli ishorali ildizlarga ega bo'ladi?
- 55 a ning qanday qiymatlarida $x^2 - (3a+4)x - a^2 + 9 = 0$ tenglama turli ishorali ildizlarga ega bo'ladi?
- 56 a ning qanday qiymatlarida $x^2 + (a+3)x - 2a - 3 = 0$ tenglama ikkita musbat yechimga ega bo'ladi?

7. PARAMETRLI TENGLAMA VA TENGSIZLIKLAR

57 a ning qanday qiymatlarida
 $x^2 + (a+4)x - 4a - 5 = 0$ tenglama ikkita musbat
ildizga ega bo'ladi?

58 a ning qanday qiymatlarida
 $x^2 + (a+1)x + 4a - 1 = 0$ tenglama ikkita manfiy
ildizga ega bo'ladi?

59 a ning qanday qiymatlarida
 $x^2 - (a+3)x + a + 4 = 0$ tenglama 2 ta manfiy
ildizga ega bo'ladi?

60 a ning qanday qiymatlarida
 $x^2 + (a+1)x - 2a - 6 = 0$ tenglama bir xil ishorali
ikkita turli ildizga ega bo'ladi?

61 a ning qanday qiymatlarida
 $ax^2 - 6x + a > 0$ tengsizlik x ning ixtiyoriy
qiymatida o'rinli bo'ladi?

62 k ning qanday qiymatlarida
 $kx^2 + 12x + k + 5 < 0$ tengsizlik yechimga ega
bo'lmaydi?

7. PARAMETRLI TENGLAMA VA TENGSIZLIKLAR

63 a ning qanday qiymatida $x^2 - (a+2)x + a^2 - 8 = 0$ tenglama ildizlarining nisbati 2 ga teng bo'ladi?

64 a parametrining qanday qiymatlarida
$$\begin{cases} x + 2y = a^2 + 4a + 4 \\ 4x + y = 4a^2 + 9a + 2 \end{cases}$$
 tenglamalar sistemasining yechimlari $x + y > 0$ tengsizlikni qanoatlantiradi?

65 a parametrning qanday qiymatlarida
$$\begin{cases} 2x + 5y = 2a^2 + a + 25 \\ x + y = a^2 + 2a + 5 \end{cases}$$
 tenglamalar sistemasining yechimlari $x - y > 0$ tengsizlikni qanoatlantiradi?

Iqtidorli o'quvchilar uchun

66 a manfiy son bo'lsa, $-x \leq \frac{1}{ax}$ tengsizlikni yeching.

67 $x^3 - ax^2 + bx - 120 = 0$ tenglama 3 ta natural yechimga ega. a ning eng kichik qiymatini toping.

68 $x^3 - ax^2 + bx - 210 = 0$ tenglama 3 ta natural yechimga ega. a ning eng kichik qiymatini toping.

7. PARAMETRLI TENGLAMA VA TENGSIZLIKLAR

69 $x^3 - ax + 16 = 0$ tenglama 3 ta har xil ildizga ega. Agar ildizlaridan 2 tasining yig'indisi 4 ga teng bo'lsa, a ning qiymatini toping.

70 $x^3 - ax + 27 = 0$ tenglama 3 ta har xil ildizga ega. Agar ildizlaridan 2 tasining yig'indisi -3 ga teng bo'lsa, a ning qiymatini toping.

JAVOBLAR

- | | | | | | |
|-----|---------------|-----|--------------------------------------------------------|-----|--------------------------------------------------------------------------------------|
| 1. | 1 | 26. | ± 5 | 49. | $(0; 2)$ |
| 2. | 4 | 27. | -10 | 50. | $(-8; 8)$ |
| 3. | $\frac{5}{7}$ | 28. | ± 1 | 51. | $(-12; 12)$ |
| 4. | $\frac{5}{7}$ | 29. | ± 12 | 52. | $(-2; 6)$ |
| 5. | 10 | 30. | -2 | 53. | $(-\infty; -4) \cup (2; \infty)$ |
| 6. | -7 | 31. | 12 | 54. | $(-2; 2)$ |
| 7. | 2 | 32. | 4 | 55. | $(-\infty; -3) \cup (3; \infty)$ |
| 8. | 3; 4 | 33. | 5 | 56. | $(-\infty; -7 - 2\sqrt{7})$ |
| 9. | 4 | 34. | -8 | 57. | $(-\infty; -12 - 6\sqrt{3})$ |
| 10. | 0 | 35. | 1; 2 | 58. | $\left(\frac{1}{4}; 7 - 2\sqrt{11}\right) \cup (7 + 2\sqrt{11}; \infty)$ |
| 11. | 1 | 36. | -4 | 59. | $(-4; -1 - 2\sqrt{2})$ |
| 12. | 2 | 37. | $\pm\sqrt{22}$ | 60. | $(-\infty; -5) \cup (-5; -3)$ |
| 13. | -3 | 38. | ± 2 | 61. | $(3; \infty)$ |
| 14. | -12 | 39. | $3; -\frac{11}{3}$ | 62. | $(4; \infty)$ |
| 15. | 4 | 40. | 4 | 63. | $4; -\frac{20}{7}$ |
| 16. | -3 | 41. | $(-3; -1) \cup (3; 4)$ | 64. | $(-\infty; -2) \cup (-1; \infty)$ |
| 17. | 12 | 42. | $(-5; 4) \cup (4; 5)$ | 65. | $(-\infty; -5) \cup (1; \infty)$ |
| 18. | 8 | 43. | $(-\infty; 2) \cup (3; \infty)$ | 66. | $\left[-\frac{1}{\sqrt{-a}}; 0\right) \cup \left[\frac{1}{\sqrt{-a}}; \infty\right)$ |
| 19. | 16 | 44. | $(-\infty; -5) \cup \left(-\frac{1}{2}; \infty\right)$ | 67. | 15 |
| 20. | 16 | 45. | $(-\infty; 1) \cup \left(\frac{11}{4}; \infty\right)$ | 68. | 18 |
| 21. | -3 | 46. | $(-\infty; -4) \cup (0; \infty)$ | 69. | 12 |
| 22. | -36 | 47. | $(-\infty; 0) \cup (2; \infty)$ | 70. | 18 |
| 23. | -8 | 48. | $\left(0; \frac{3}{2}\right)$ | | |
| 24. | -6 | | | | |
| 25. | -2 | | | | |

Mavzuga doir murakkab masalalar yechilish usullari bilan tanishish uchun QR code ni skanerlang yoki suratga olib, @idcuzbot ga yuboring.



Qaydlar uchun

4-7-mavzular bo'yicha takrorlash testi

- 1 $x(x + 6) < 6(x + 5)$ tengsizlikning butun yechimlari nechta?
A) cheksiz ko'p B) 10 C) 11 D) 6
- 2 $\frac{(x^2 - x + 1)(x - 1)}{x^2 - 5x + 6} > 0$ tengsizlikni nechta natural son qanoatlantirmaydi?
A) 1 B) 2 C) 3 D) 4
- 3 p parametrning qanday qiymatida $y = -x^2 + 2x + p - 1$ funksiyaning eng katta qiymati 7 ga teng bo'ladi?
A) 6 B) 7 C) -6 D) -7
- 4 Tengsizlikning eng kichik butun yechimini aniqlang: $(x^2 + 3x + 1)(x^2 + 3x + 3) < 35$
A) 0 B) -3 C) 3 D) -2
- 5 a ning qanday musbat qiymatida $y = x^2 - ax + a + 3$ parabola OX o'qiga urinadi?
A) 8 B) 2 C) 6 D) 4
- 6 $x^2 + 8x + 10$ ifodaning manfiy butun qiymatlari nechta?
A) 6 B) 7 C) mavjud emas D) 5
- 7 $x^2 + ax - 36 = 0$ tenglamaning ildizlaridan biri 3 ga teng bo'lsa, uning ikkinchi ildizini toping.
A) 8 B) -12 C) -6 D) 12

8 $\frac{(x^2 - 3x + 2)(x - 1)}{x^2 + 5x + 6} \leq 0$ tengsizlikni yeching.
 A) $(-3; -2) \cup [1; 2] \cup [2; \infty)$ B) $(-\infty; 1] \cup \{2\}$
 C) $(-\infty; -3) \cup (-2; 2]$ D) $(-\infty; -2) \cup (-2; 2]$

9 $y = 2x^2 + 12x + 6$ parabola uchining koordinatasini toping.
 A) $(-3; -12)$ B) $(-3; 12)$
 C) $(-6; 6)$ D) $(-6; -66)$

10 Tengsizlikni yeching:
 $(x^2 + 10x + 10)(x^2 + x + 10) < 10x^2$
 A) $(-10; 1)$ B) $(-10; -1)$
 C) $(-10; 10)$ D) $(1; 10)$

11 $x - \frac{60}{x} < 4$ tengsizlik nechta natural yechimga ega?
 A) 6 B) 5 C) 9 D) 10

12 $\frac{(x - 4)(2x^2 - 6x + 5)}{4x^2 - 12x + 9} \leq 0$ tengsizlikni yeching.
 A) $\left(-\frac{3}{2}; 4\right]$ B) $(-\infty; 4]$
 C) $\left(-\infty; -\frac{3}{2}\right) \cup \left(-\frac{3}{2}; 4\right]$ D) $\left(-\infty; -\frac{3}{2}\right)$

13 $y = -x^2 + px + q + 3$ parabolaning uchi $(-1; 3)$ nuqtada joylashgan bo'lsa, $2p + 3q$ ning qiymatini toping.
 A) 6 B) 7 C) -6 D) -7

14 $y = x^2 - 3x - 4$ kvadrat funksiyaning koordinata o'qlari bilan kesishgan nuqtalari koordinatalari yig'indisini toping.
 A) -1 B) -4 C) 1 D) -5

4-7-mavzular bo'yicha takrorlash testi

- 15) Quyidagi kvadrat funksiyalardan qaysi birining uchi (1;2) nuqtada joylashgan?
A) $y = x^2 + 2x$ B) $y = x^2 - 2x + 4$
C) $y = -x^2 - 2x + 7$ D) $y = x^2 - 2x + 3$
- 16) $y = x^2 + 6x$ parabolaning simmetriya o'qini ko'rsating.
A) $x = -3$ B) $y - 3 = 0$
C) $x = -6$ D) $x = 3$
- 17) $(-1;0)$, $(0;2)$, $(1;0)$ nuqtalardan o'tuvchi parabola tenglamasini tuzing.
A) $y = 2x^2 - 2$ B) $y = x^2 - 1$
C) $y = -x^2 + 2$ D) $y = -2x^2 + 2$
- 18) $y = x^2 - 4x + 2$ funksiyaning qiymatlar sohasini toping.
A) $(-2; \infty)$ B) $[2; \infty)$
C) $[-2; \infty)$ D) $[0; \infty)$
- 19) $y = x^2 + 6x - 4$ funksiya uchidan Ox o'qigacha bo'lgan masofani toping.
A)3 B)2 C)12 D)13
- 20) $x^5 < x^7$ tengsizlikni yeching.
A) $(-\infty; -1) \cup (1; \infty)$ B) $(-\infty; 0) \cup (1; \infty)$
C) $(0; 1) \cup (1; \infty)$ D) $(-1; 0) \cup (1; \infty)$
- 21) x ning barcha qiymatlarida o'rinli bo'lgan tengsizlikni ko'rsating.
A) $x^2 - 2x + 1 > 0$ B) $x^2 - 3x + 4 < 0$
C) $x^2 + 4x - 4 \leq 0$ D) $x^2 + 4x + 4 \geq 0$
- 22) $2(x - 1)^2 + 3(y - 2)^2 < 5$ tengsizlikning butun yechimlari sonini toping.
A)3 B)5 C)8 D)9

23 Nechta butun son $y = \sqrt{6 - 5x - x^2}$ funksiyaning aniqlanish sohasiga tegishli?
A)4 B)5 C)8 D)7

24 $(x^2 + 3x - 4)^2 + (x^2 + 6x - 7)^2 \leq 0$ tengsizlikning butun yechimlari sonini toping.
A)1 B)2 C)3 D)4

25 $x^2 + ax + b = 0$ tenglamaning ildizlari 4 va 7 ga teng bo'lsa, $a + b$ ning qiymatini toping.
A)28 B)-11 C)7 D)17

26 k ning nechta butun qiymatida $x^2 - (k + 1)x + k + 4 = 0$ tenglama yechimga ega bo'lmaydi?
A)6 B)7 C)8 D)9

27 $x^3 - ax - 6 = 0$ tenglamaning ikkita ildizi yig'indisi -3 ga teng bo'lsa, a ning qiymatini toping.
A)6 B)7 C)-7 D)3

28 a ning qanday qiymatlarida $x^2 + (a - 3)x + 9 = 0$ tenglama ikkita har xil manfiy ildizlarga ega bo'ladi?
A) $(-\infty; 3)$ B) $(3; \infty)$
C) $(-\infty; -3)$ D) $(9; \infty)$

29 a ning nechta natural qiymatida $x^2 - (a + 2)x + 3a - 2 < 0$ tengsizlik yechimga ega bo'lmaydi?
A)3 B)4 C)5 D)6

30 a ning nechta butun qiymatida $y = x^2 - (2a - 3)x + a^2 - 9$ funksiyaning grafigi koordinata tekisligining barcha choraklaridan o'tadi?
A)3 B)4 C)5 D)6

8. Modulli ifodalar va tenglamalar

1-20. Ifodani modul ta'rifidan foydalanib soddalashtiring.

1 $x \geq 1$ bo'lsa, $|x - 1|$ ni.

2 $x \leq -2$ bo'lsa, $|x + 2|$ ni.

3 $x \geq 2$ bo'lsa, $|2x - 4|$ ni.

4 $x \geq 3$ bo'lsa, $|3x - 9|$ ni.

5 $x \leq -2$ bo'lsa, $|4x + 6|$ ni.

6 $x \geq 2$ bo'lsa, $|x - 2| + |x + 2|$ ni.

7 $x > 3$ bo'lsa, $|x - 3| + |x + 3|$ ni.

8 $-4 < x \leq 1$ bo'lsa, $|x - 1| + |x + 4|$ ni.

9 $x > 0,5$ bo'lsa, $|x + 1| + |x + 3|$ ni.

10 $-5 \leq x \leq -2$ bo'lsa, $|x + 2| + |x + 5|$ ni.

11 $x > 1$ bo'lsa, $|2x - 2| + |x + 3|$ ni.

12 $x < -2$ bo'lsa, $|3x - 3| + |2x + 3|$ ni.

13 $-2 < x \leq 0$ bo'lsa, $|4x - 2| + |2x + 4|$ ni.

$$14 \quad x \geq 1 \text{ bo'lsa, } |2x + 1| + |-3x + 3| \text{ ni.}$$

$$15 \quad -0,6 < x \leq 2 \text{ bo'lsa, } |-x + 2| + |3x + 5| \text{ ni.}$$

$$16 \quad x > -1 \text{ bo'lsa, } x - 2 - \frac{x^2 - 1}{|x + 1|} \text{ ni.}$$

$$17 \quad x < -4 \text{ bo'lsa, } \frac{2x + 2}{x - |x + 2|} + 2x \text{ ni.}$$

$$18 \quad -2 < x \leq 4 \text{ bo'lsa, } |x - 4| - |x + 2| - x \text{ ni.}$$

$$19 \quad x < -2,5 \text{ bo'lsa, } x|x + 2| - (x + 3)|x - 1| \text{ ni.}$$

$$20 \quad 0 < x \leq 3 \text{ bo'lsa, } |x - 3|(|x| + 3) - x^2 \text{ ni.}$$

21-50. Tenglamani yeching.

$$21 \quad |4x - 2| = 4x - 2$$

$$22 \quad |2x - 6| = 2x - 6$$

$$23 \quad |4 - x^2| = 4 - x^2$$

$$24 \quad |x^2 - 9| = x^2 - 9$$

$$25 \quad |x^2 - 2x| = x^2 - 2x$$

$$26 \quad |3x - 2| = -3x + 2$$

$$27 \quad |4x - 6| = -4x + 6$$

8. MODULLI IFODALAR VA TENGLAMALAR

$$28 \quad |x^2 - 4x + 3| = 4x - x^2 - 3$$

$$29 \quad |x^2 - 10x + 9| = 10x - x^2 - 9$$

$$30 \quad |x^3 - x| = x - x^3$$

$$31 \quad |2x - 3| = 0$$

$$32 \quad |3x - 4| = 0$$

$$33 \quad |5x + 3| = -8$$

$$34 \quad |3x - 1| = 5$$

$$35 \quad |6x - 11| = 7$$

$$36 \quad |8 - 3x| = 2$$

$$37 \quad |x^2 - 5x| = 0$$

$$38 \quad |3x - x^2| = -11$$

$$39 \quad |x^2 - 17| = 19$$

$$40 \quad |x^2 + 2x - 4| = 11$$

$$41 \quad |4x + 1| = |2x + 3|$$

$$42 \quad |5x - 2| = |2x + 1|$$

$$43 \quad |3x - 5| = |3x + 1|$$

$$44 \quad |4x - 7| = |2x + 3|$$

$$45 \quad |x^2 + 5x| = |x^2 - 3x|$$

$$46 \quad |x^2 - 4x + 3| + |x - 1| = 0$$

$$47 \quad |x^2 - 3x + 2| + |x^2 - 1| = 0$$

$$48 \quad |x^2 - 1| + |x^2 - x - 2| = 0$$

$$49 \quad |x^2 + 5x + 6| + |x^2 - 4| = 0$$

$$50 \quad |x^2 - 9| + |x^2 + x - 6| = 0$$

8. MODULLI IFODALAR VA TENGLAMALAR

51-55. Tenglamani yig'indisini toping.

51 $||x + 1| + 3| = 5$

52 $||x + 3| - 5| = 9$

53 $||x - 5| + 1| = 3$

54 $||2x - 7| + 3| = 6$

55 $|2 - |x - 1|| = 2$

56-80. Tenglamani yeching.

56 $x^2 - 5|x| + 6 = 0$

57 $x^2 + 3|x| - 4 = 0$

58 $(2|x + 2| + 1)^2 = 3(x + 2)^2 + 6$

59 $(|x + 1| + 2)^2 = 2(x + 1)^2 + 7$

$$\boxed{60} \quad 2|x-4| + 8 = |x-4|^2$$

$$\boxed{61} \quad \frac{|x-3|+1}{|x-3|-1} = \frac{3}{2}$$

$$\boxed{62} \quad \frac{(2|x|-3)^2 - |x| - 6}{4x+1} = 0$$

$$\boxed{63} \quad \frac{4x^2 - 64}{|x| + 4} = 3|x|$$

$$\boxed{64} \quad \frac{3x^2 - 3}{|x| + 3} = 7 - |x|$$

$$\boxed{65} \quad \frac{2x^2 - 6}{|x| - 1} = |x| + 3$$

$$\boxed{66} \quad \frac{6}{|x+3|-1} = |x+3| - 2$$

$$\boxed{67} \quad \frac{12}{|x+5|-2} = |x+5| - 3$$

20. Funksiya (3-qism)

1 $y = 2x - 5$ funksiyaning OX o'qiga nisbatan simmetrigini toping.

2 $y = -4x + 3$ funksiyaning OX o'qiga nisbatan simmetrigini toping.

3 $y = 4x + 3$ funksiyaning OY o'qiga nisbatan simmetrigini toping.

4 $y = 3x - 2$ funksiyaning OY o'qiga nisbatan simmetrigini toping.

5 $y = 2x - 3$ funksiyaning koordinatalar boshiga nisbatan simmetrigini toping.

6 $y = -5x - 4$ funksiyaning koordinatalar boshiga nisbatan simmetrigini toping.

7 $y = 7x + 9$ funksiyaning $y = x$ to'g'ri chiziqqa nisbatan simmetrigini toping.

8 $y = 9 - 4x$ funksiyaning $y = x$ to'g'ri chiziqqa nisbatan simmetrigini toping.

9 $y = 5x - 2$ funksiyaning $x = 2$ to'g'ri chiziqqa nisbatan simmetrigini toping.

10 $y = 9x - 11$ funksiyaning $x = 3$ to'g'ri chiziqqa nisbatan simmetrigini toping.

11 $y = 3x - 5$ funksiyaning $y = 2$ to'g'ri chiziqqa nisbatan simmetrigini toping.

12 $y = -2x + 11$ funksiyaning $y = 2$ to'g'ri chiziqqa nisbatan simmetrigini toping.

20. FUNKSIYA (3-QISM)

- 13 $y = 6x + 1$ funksiyaning $(2; 1)$ nuqtaga nisbatan simmetrigini toping.
- 14 $y = 4x - 9$ funksiyaning $(2; 1)$ nuqtaga nisbatan simmetrigini toping.
- 15 $y = x^2 - 5x + 6$ funksiyaning OX o'qiga nisbatan simmetrigini toping.
- 16 $y = x^2 + 4x + 3$ funksiyaning OY o'qiga nisbatan simmetrigini toping.
- 17 $y = x^2 - 7x - 8$ funksiyaning koordinatalar boshiga nisbatan simmetrigini toping.
- 18 $y = x^2 - 3x + 2$ funksiyaning $x = 2$ to'g'ri chiziqqa nisbatan simmetrigini toping.
- 19 $y = x^2 + 5x + 3$ funksiyaning $y = 2$ to'g'ri chiziqqa nisbatan simmetrigini toping.
- 20 $y = x^2 - 6x + 6$ funksiyaning $(2; 1)$ nuqtaga nisbatan simmetrigini toping.
- 21 $y = 3x - 2$ to'g'ri chiziqni $\vec{a}(3; 2)$ vektor bo'yicha parallel ko'chirishdan hosil bo'lgan funksiyani toping.
- 22 $y = 4 - 5x$ to'g'ri chiziqni $\vec{a}(-3; 5)$ vektor bo'yicha parallel ko'chirishdan hosil bo'lgan funksiyani toping.

- 23 $y = x^2$ parabolani $\vec{a}(-2; 2)$ vektor bo'yicha parallel ko'chirishdan hosil bo'lgan funksiyani toping.
- 24 $y = x^2 - 2x - 3$ parabolani $\vec{a}(3; -4)$ vektor bo'yicha parallel ko'chirishdan hosil bo'lgan funksiyani toping.
- 25 $y = 2x^2 + 4x - 3$ parabolani $\vec{a}(1; -3)$ vektor bo'yicha parallel ko'chirishdan hosil bo'lgan funksiyani toping.
- 26 $y = \frac{x-2}{x+3}$ funksiya grafigini $\vec{a}(-1; -2)$ vektor bo'yicha parallel ko'chirishdan hosil bo'lgan funksiyani toping.
- 27 $y = 2\sqrt{x} - 1$ funksiya grafigini $\vec{a}(-1; 4)$ vektor bo'yicha parallel ko'chirishdan hosil bo'lgan funksiyani toping.
- 28 $y = 2^{x+1} - 3$ funksiya grafigini $\vec{a}(1; -2)$ vektor bo'yicha parallel ko'chirishdan hosil bo'lgan funksiyani toping.
- 29 $y = x^3 + 3x$ funksiya grafigini $\vec{a}(1; -1)$ vektor bo'yicha parallel ko'chirishdan hosil bo'lgan funksiyani toping.
- 30 $y = \frac{x^2 + 2x}{x - 3}$ funksiya grafigini $\vec{a}(-1; 4)$ vektor bo'yicha parallel ko'chirishdan hosil bo'lgan funksiyani toping.
- 31 $y = 2x + 1$ funksiya grafigini OX o'qi bo'yicha 2 birlik o'ngga, OY o'qi bo'yicha 3 birlik pastga parallel siljitishdan qaysi funksiya grafigi hosil bo'ladi?
- 32 $y = 3x - 2$ funksiya grafigini OX o'qi bo'yicha 3 birlik chapga, OY o'qi bo'yicha 2 birlik pastga parallel siljitishdan qaysi funksiya grafigi hosil bo'ladi?

20. FUNKSIYA (3-QISM)

- 33** $y = x^2$ funksiya grafigini OX o'qi bo'yicha 2 birlik o'ngga, OY o'qi bo'yicha 3 birlik yuqoriga parallel siljitishdan hosil bo'ladigan funktsiyani toping.
- 34** $y = x^2 + 2x$ funksiya grafigini OX o'qi bo'yicha 1 birlik chapga, OY o'qi bo'yicha 2 birlik yuqoriga parallel siljitishdan hosil bo'ladigan funktsiyani toping.
- 35** $y = \frac{2x - 2}{x + 3}$ funksiya grafigini OX o'qi bo'yicha 3 birlik chapga, OY o'qi bo'yicha 2 birlik yuqoriga parallel siljitishdan qaysi funksiya grafigi hosil bo'ladi?
- 36** $y = \frac{x - 4}{2x + 1}$ funksiya grafigini OX o'qi bo'yicha 1 birlik o'ngga, OY o'qi bo'yicha 4 birlik pastga parallel siljitishdan qaysi funksiya grafigi hosil bo'ladi?
- 37** $y = 2^x$ funksiya grafigini OX o'qi bo'yicha 4 birlik o'ngga, OY o'qi bo'yicha 5 birlik pastga parallel siljitishdan qaysi funksiya grafigi hosil bo'ladi?
- 38** $y = 3^x$ funksiya grafigini OX o'qi bo'yicha 2 birlik chapga, OY o'qi bo'yicha 1 birlik pastga parallel siljitishdan qaysi funksiya grafigi hosil bo'ladi?
- 39** $y = x^3$ funksiya grafigini OX o'qi bo'yicha 1 birlik o'ngga, OY o'qi bo'yicha 2 birlik yuqoriga parallel siljitishdan qaysi funksiya grafigi hosil bo'ladi?
- 40** $y = x^3 + 3x$ funksiya grafigini OX o'qi bo'yicha 1 birlik o'ngga, OY o'qi bo'yicha 3 birlik pastga parallel siljitishdan qaysi funksiya grafigi hosil bo'ladi?

41 $f(x) = 3x - 7$ bo'lsa, $f(x+1)$ funksiyani aniqlang.

42 $f(x) = x^2 + x - 2$ bo'lsa, $f(2x)$ funksiyani aniqlang.

43 $f(x) = \frac{2x-1}{x+3}$ bo'lsa, $f(x+2)$ funksiyani aniqlang.

44 $f(x) = x + \frac{1}{x}$ bo'lsa, $f(3x)$ funksiyani aniqlang.

45 $f(x) = x^3 + \frac{1}{x^2}$ bo'lsa, $f\left(\frac{x}{2}\right)$ funksiyani aniqlang.

46 Agar $f(x) = 2x+1$ va $g(x) = x+2$ bo'lsa, $f(g(x))$ funksiyani aniqlang.

47 Agar $f(x) = 3^x$ va $g(x) = 2x+1$ bo'lsa, $f(g(x))$ funksiyani aniqlang.

48 Agar $f(x) = 2x^2 + x$ va $g(x) = 3x+1$ bo'lsa, $f(g(x))$ funksiyani aniqlang.

49 Agar $f(x) = 2x+1$ va $g(x) = \frac{2x+1}{2x-1}$ bo'lsa, $f(g(x))$ funksiyani aniqlang.

50 Agar $f(x) = 3x-1$ va $g(x) = x^2+2x+1$ bo'lsa, $f(g(x))$ funksiyani aniqlang.

20. FUNKSIYA (3-QISM)

51 $f(2x) = 4x^2 + 2x - 6$ bo'lsa, $f(x)$ ni toping.

52 $f(-2x) = \frac{4x-3}{6x+11}$ bo'lsa, $f(x)$ ni toping.

53 $f(3x) = \frac{x}{x+2}$ bo'lsa, $f(x)$ ni toping.

54 $f\left(\frac{x}{3}\right) = \frac{6x+2}{18x^2-4}$ bo'lsa, $f(x)$ ni toping.

55 $f(x+3) = \frac{x}{x-1}$ bo'lsa, $f(x)$ ni toping.

56 $f(2x+1) = \frac{4x-3}{x-1}$ bo'lsa, $f(x)$ ni toping.

57 $f\left(\frac{x+1}{x-1}\right) = x$ bo'lsa, $f(x)$ ni toping.

58 $f\left(\frac{2x+1}{x+3}\right) = x$ bo'lsa, $f(x)$ ni toping.

59 Agar $f(6-x)+8f(x) = 3x^2$ bo'lsa, $f(3)$ ni toping.

60 Agar $f(8-x) + 3f(x) = x^2 - 2x$ bo'lsa, $f(4)$ ni toping.

61 Agar $f(7-x) - 8f(x) = 4x^2$ bo'lsa, $f\left(\frac{7}{2}\right)$ ni toping.

62 Agar $f(4-x) + 2f(x) = 3x^2$ bo'lsa, $f(1)$ ni toping.

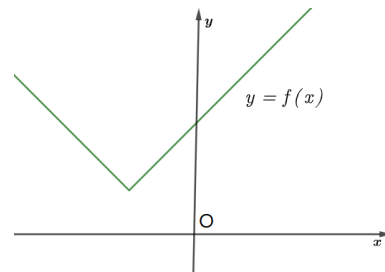
63 Agar $f(7-x) + 2f(x) = \frac{x+12}{6}$ bo'lsa, $f(6)$ ni toping.

64 Agar $f(5-x) + 3f(x) = 2x^2 + 4$ bo'lsa, $f(2)$ ni toping.

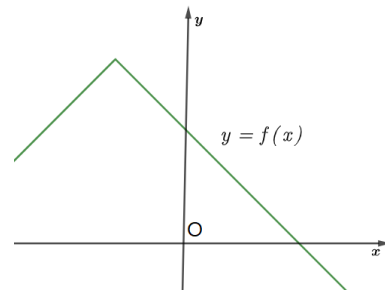
65 Agar $f\left(\frac{6}{x}\right) + 3f(x) = 2^x$ bo'lsa, $f(2)$ ni toping.

66-70. Agar grafiklarda $y = a + b|x + c|$ funksiyaning grafiklari tasvirlangan bo'lsa, a, b, c larning ishorasini aniqlang.

66

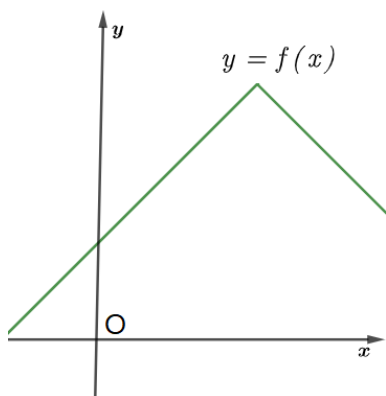


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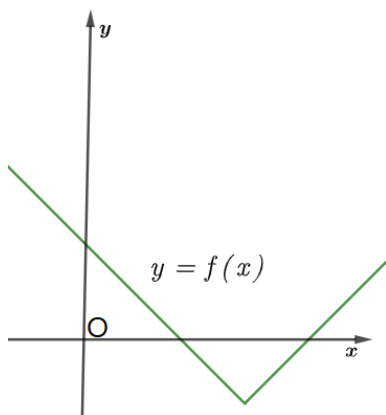


20. FUNKSIYA (3-QISM)

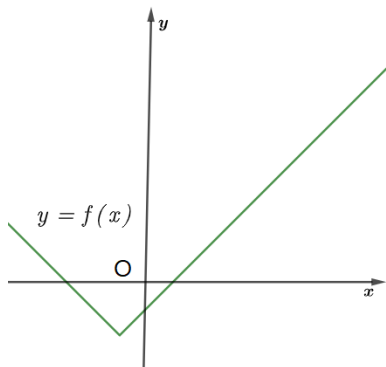
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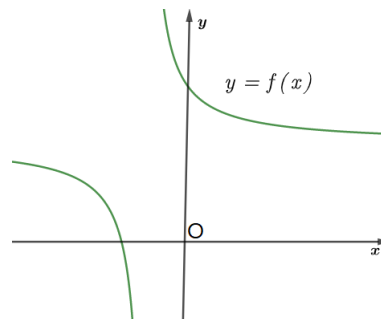


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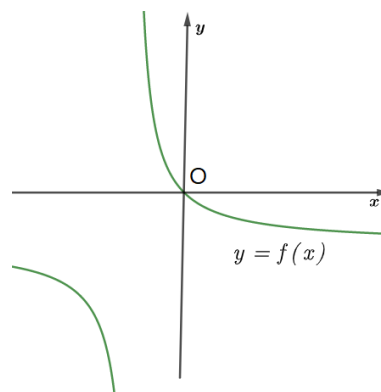


71-75. Agar grafiklarda $y = \frac{a}{x+b} + c$ funksiyaning grafiklari tasvirlangan bo'lsa, a, b, c larning ishorasini aniqlang.

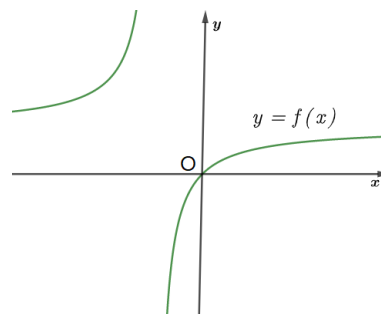
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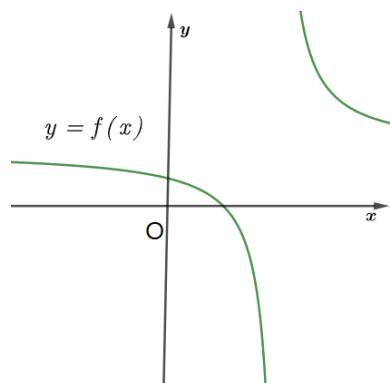
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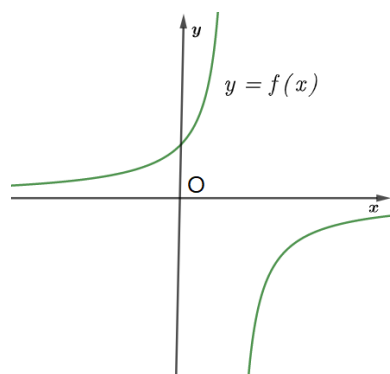
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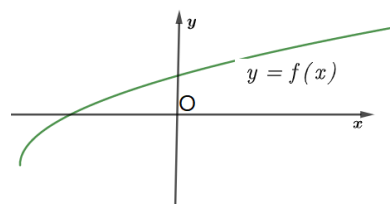


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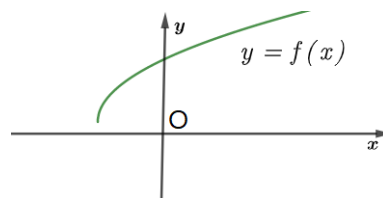


76-80. Agar grafiklarda $y = a + b\sqrt{cx+d}$ funksiyaning grafiklari tasvirlangan bo'lsa, a, b, c, d larning ishorasini aniqlang.

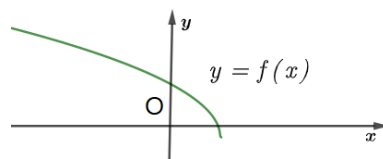
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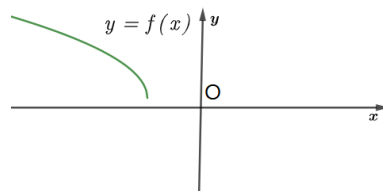
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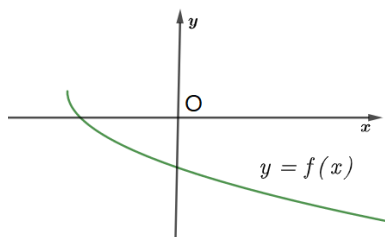


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20. FUNKSIYA (3-QISM)

80



81 Agar $f(x)$ funksiyaning aniqlanish sohasi $(-1; 2)$ bo'lsa, $f\left(\frac{x}{2}\right)$ funksiyaning aniqlanish sohasini toping.

82 Agar $f(x)$ funksiyaning aniqlanish sohasi $(2; 4)$ bo'lsa, $f(2x)$ funksiyaning aniqlanish sohasini toping.

83 Agar $f(x)$ funksiyaning aniqlanish sohasi $[-2; 1]$ bo'lsa, $f(x+1)$ funksiyaning aniqlanish sohasini toping.

84

Agar $f(x)$ funksiyaning aniqlanish sohasi $(1; 4)$ bo'lsa, $f(x^2)$ funksiyaning aniqlanish sohasini toping.

85

Agar $f(x)$ funksiyaning aniqlanish sohasi $[-2; 3]$ bo'lsa, $f(1 - |x|)$ ning aniqlanish sohasini toping.

86

Agar $g(x) = 3x$ va $f(g(x)) = \frac{2x-5}{x-1}$ bo'lsa, $f(x)$ ni toping.

87

Agar $g(x) = x-5$ va $f(g(x)) = x^2 + x - 2$ bo'lsa, $f(x)$ ni toping.

88 Agar $g(x) = 2x - 4$ va $f(g(x)) = 4x^2 + 6x - 8$ bo'lsa, $f(x)$ ni toping.

91 Agar $f(x^2) - 3f(7 - 3x) = \frac{x+6}{x}$ bo'lsa, $f(4)$ ni toping.

89 Agar $g(x) = \frac{x-1}{x+1}$ va $f(g(x)) = \frac{2x+3}{x+2}$ bo'lsa, $f(x)$ ni toping.

92 Agar $f(x) + 2f\left(\frac{6}{x}\right) = 3x$ bo'lsa, $f(x)$ ni toping.

Iqtidorli o'quvchilar uchun

90 Agar $f(5 - 2x) - 2f(2x) = \frac{6}{x}$ bo'lsa, $f(2)$ ni toping.

93 Agar $f(x+1) - 2f(1-x) = x+2$ bo'lsa, $f(x)$ ni toping.

20. FUNKSIYA (3-QISM)

94. Agar $f(2x + 1) - 3f(1 - 2x) = x^2 + 2x$ bo'lsa, $f(x)$ ni toping.

95. $f(x) = \min\left(-x + 2, \frac{x + 4}{2}, -2x + 12\right)$ bo'lsa, $f(x)$ ning eng katta qiymatini toping.

JAVOBLAR

1. $y = 5 - 2x$

2. $y = 4x - 3$

3. $y = -4x + 3$

4. $y = -3x - 2$

5. $y = 2x + 3$

6. $y = -5x + 4$

7. $y = \frac{x - 9}{7}$

8. $y = \frac{9 - x}{4}$

9. $y = -5x + 18$

10. $y = -9x + 43$

11. $y = -3x + 9$

12. $y = 2x - 7$

13. $y = 6x - 23$

14. $y = 4x - 5$

15. $y = -x^2 + 5x - 6$

16. $y = x^2 - 4x + 3$

17. $y = -x^2 - 7x + 8$

18. $y = x^2 - 5x + 6$

19. $y = -x^2 - 5x + 1$

20. $y = -x^2 + 2x + 4$

21. $y = 3x - 9$

22. $y = -5x - 6$

23. $y = x^2 + 4x + 6$

24. $y = x^2 - 8x + 8$

25. $y = 2x^2 - 8$

26. $y = -\frac{x + 9}{x + 4}$

27. $y = 2\sqrt{x + 1} + 3$

28. $y = 2^x - 5$

29. $y = x^3 - 3x^2 + 6x - 5$

30. $y = \frac{x^2 + 8x - 5}{x - 2}$

31. $y = 2x - 6$

32. $y = 3x + 5$

33. $y = x^2 - 4x + 7$

34. $y = x^2 + 4x + 5$

35. $y = \frac{4x + 16}{x + 6}$

36. $y = \frac{7x + 1}{1 - 2x}$

37. $y = 2^{x-4} - 5$

38. $y = 3^{x+2} - 1$

39. $y = x^3 - 3x^2 + 3x + 1$

40. $y = x^3 - 3x^2 + 6x - 7$

41. $f(x + 1) = 3x - 4$

42. $f(2x) = 4x^2 + 2x - 2$

43. $f(x + 2) = \frac{2x + 3}{x + 5}$

44. $f(3x) = 3x + \frac{1}{3x}$

45. $f\left(\frac{x}{2}\right) = \frac{x^3}{8} + \frac{4}{x^2}$

46. $f(g(x)) = 2x + 5$

47. $f(g(x)) = 3^{2x+1}$

48. $f(g(x)) = 18x^2 + 15x + 3$

49. $f(g(x)) = \frac{6x + 1}{2x - 1}$

50. $f(g(x)) = 3x^2 + 6x + 2$

51. $f(x) = x^2 + x - 6$

52. $f(x) = \frac{2x + 3}{3x - 11}$

53. $f(x) = \frac{x}{x + 6}$

54. $f(x) = \frac{9x + 1}{81x^2 - 2}$

55. $f(x) = \frac{x - 3}{x - 4}$

56. $f(x) = \frac{4x - 10}{x - 3}$

57. $f(x) = \frac{x + 1}{x - 1}$

58. $f(x) = \frac{3x - 1}{2 - x}$

- | | | | | | |
|-----|-----------------------|-----|------------------------------|-----|----------------------------------|
| 59. | 3 | 72. | $a > 0; b > 0; c < 0$ | 86. | $f(x) = \frac{2x - 15}{x - 3}$ |
| 60. | 2 | 73. | $a < 0; b > 0; c > 0$ | 87. | $f(x) = x^2 + 11x + 28$ |
| 61. | -7 | 74. | $a > 0; b < 0; c > 0$ | 88. | $f(x) = x^2 + 11x + 20$ |
| 62. | -7 | 75. | $a < 0; b < 0; c = 0$ | 89. | $\frac{x - 5}{x - 3}$ |
| 63. | $\frac{23}{18}$ | 76. | $a < 0; b > 0; c > 0; d > 0$ | 90. | $-\frac{16}{3}$ |
| 64. | $\frac{7}{4}$ | 77. | $a > 0; b > 0; c > 0; d > 0$ | 91. | $-\frac{25}{8}$ |
| 65. | 0, 5 | 78. | $a < 0; b > 0; c < 0; d > 0$ | 92. | $f(x) = \frac{12}{x} - x$ |
| 66. | $a > 0; b > 0; c > 0$ | 79. | $a > 0; b > 0; c < 0; d < 0$ | 93. | $f(x) = \frac{x - 7}{3}$ |
| 67. | $a > 0; b < 0; c > 0$ | 80. | $a > 0; b < 0; c > 0; d > 0$ | 94. | $f(x) = -\frac{x^2 - 4x + 3}{8}$ |
| 68. | $a > 0; b < 0; c < 0$ | 81. | $(-2; 4)$ | 95. | 2 |
| 69. | $a < 0; b > 0; c < 0$ | 82. | $(1; 2)$ | | |
| 70. | $a < 0; b > 0; c > 0$ | 83. | $[-3; 0]$ | | |
| 71. | $a > 0; b > 0; c > 0$ | 84. | $(-2; -1) \cup (1; 2)$ | | |
| | | 85. | $[-3; 3]$ | | |

Mavzuga doir murakkab masalalar yechilish usullari bilan tanishish uchun QR code ni skanerlang yoki suratga olib, @idcuzbot ga yuboring.



Qaydlar uchun