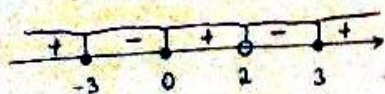


1. $\frac{x^3}{x-2} \leq \frac{9x}{x-2}$ tengsizlikni yeching

$$\frac{x(x^3-9)}{x-2} \leq 0 \Rightarrow \frac{x(x-3)(x+3)}{x-2} \leq 0$$



Javob: $[-3; 0] \cup (2; 3]$

2. Tenglamani yeching

$$(\sqrt{2})^{4x-2} = (\sqrt{2})^{-\frac{2x}{3}}$$

$$2^{\frac{2x-1}{2}} = 2^{-\frac{x}{3}}$$

$$\frac{2x-1}{2} = -\frac{x}{3} \Rightarrow 6x-3 = -2x$$

$$8x = 3 \Rightarrow x = \frac{3}{8}$$

Javob: $x = \frac{3}{8}$

3. 1) $\int x \cdot \sin 3x \, dx$

2) $\int x \cdot \cos 2x \, dx$

Bolalrab integrallashdan:

1) $\int x \, d(-\frac{1}{3} \cos 3x) =$

$$= -\frac{x}{3} \cos 3x + \frac{1}{3} \int \cos 3x \, dx =$$

$$= -\frac{x}{3} \cos 3x + \frac{1}{9} \sin 3x + C$$

2) $\int x \cdot \cos 2x \, dx = \int x \, d(\frac{1}{2} \sin 2x) =$

$$= \frac{x}{2} \sin 2x + \frac{1}{2} \int \sin 2x \, dx =$$

$$= \frac{x}{2} \sin 2x - \frac{1}{4} \cos 2x + C$$

4. Kopyayturchilarga ajratib

$$(a-b)^2 = c^2$$

$$= (a-b+c)(a-b-c)$$

5. Ifodaning eng kichik qiymatini toping

$$\sqrt{(x-3)^2 + (y+4)^2} + \sqrt{x^2 + y^2}$$

Koshi - Bunyakovskiy dan:

$$\sqrt{(x-3)^2 + (y+4)^2} + \sqrt{x^2 + y^2} \geq$$

$$\geq \sqrt{(x-3-x)^2 + (y+4-y)^2}$$

$$\sqrt{(x-3-x)^2 + (y+4-y)^2} \geq 5$$

Demak, 5 ekan

Javob: 5

6. Soddaleshtiring:

$$\frac{(x+3)!}{(x-4)!} + \frac{(x+3)!}{(x-2)!}$$

$$\frac{(x+3)(x)(x-1)(x-2)(x-3)(x-4)!}{(x-4)!} +$$

$$\frac{(x+3)x(x-1)(x-2)!}{(x-2)!} =$$

$$= x(x+3)(x-1)(x^2-5x+6+1) =$$

$$= x(x+3)(x-1)(x^2-5x+7)$$

7. Tengsizlikni yeching:

$$\sqrt{50 \lg x} < 100x$$

$$50 \lg x < 100x \quad / : \lg$$

$$50 \lg x < \lg(100x)$$

$$\lg x < 2 \Rightarrow x < 100^2$$

A.S $x > 0$

J: $0 < x < 100^2$

8. Tenglamani yeching:

$$(2+\sqrt{3})^{x^2} + (2-\sqrt{3})^{x^2} = 4$$

$$\frac{(2+\sqrt{3})^{x^2}}{(2+\sqrt{3})^{x^2}} + \frac{1}{(2+\sqrt{3})^{x^2}} = 4$$

$$t + \frac{1}{t} = 4 \Rightarrow t^2 - 4t + 1 = 0$$

$$D = \pm 2\sqrt{3}$$

$$t_1 = 2+\sqrt{3}; t_2 = 2-\sqrt{3}$$

$$(2+\sqrt{3})^{x^2} = (2+\sqrt{3})^1$$

$$x^2 = 1 \Rightarrow x = \pm 1$$

$$(2+\sqrt{3})^{x^2} = \frac{1}{2+\sqrt{3}}$$

$$x^2 = -1 \quad \emptyset$$

Demak, $x = \pm 1$

9. $y = kx^2 - 3$ funksiya

$(-2; 9)$ nuqtadan

otsa $k = ?$

$$9 = 4k^2 - 3$$

$$k = 3$$

10. Tenglamani yeching

$$\sin 5x = \sin 6x$$

$$\sin 5x - \sin 6x = 2 \cos \frac{11x}{2} \cdot \sin \frac{x}{2} = 0$$

$$\cos \frac{11x}{2} = 0$$

$$\sin \frac{x}{2} = 0$$

$$\frac{11x}{2} = \frac{\pi}{2} + \pi n$$

$$\frac{x}{2} = \pi n$$

$$x_1 = \frac{\pi}{11} + \frac{2\pi n}{11}$$

$$x_2 = 2\pi n$$

11. $x^3 - 5x + 5 = 0$

x_1, x_2, x_3 toping
kopyayturchilar ga
ajratib olamiz:

$$x^3 - 5x + 5 = 0$$

$$x(x^2-5)+5=0$$

$$(x-1)(x^2+x-5)=0$$

$$x_1=1 \quad x^2+x-5=0$$

$$D = \pm \sqrt{21}$$

$$x_2 = \frac{-1+\sqrt{21}}{2}; x_3 = \frac{-1-\sqrt{21}}{2}$$

Javob: $x_1=1, x_2=\frac{-1+\sqrt{21}}{2}, x_3=\frac{-1-\sqrt{21}}{2}$

12. Tenglamani yeching

$$\sin x = \sin 3x$$

$$\sin 3x - \sin x = 0$$

$$2 \cos 2x \cdot \sin x = 0$$

$$\cos 2x = 0 \quad \sin x = 0$$

$$2x = \frac{\pi}{2} + \pi n \quad x = \pi n$$

$x_1 = \frac{\pi}{4} + \frac{\pi n}{2} \quad x_2 = \pi n$

13. Agar $\vec{a}(x, 2)$ va

$\vec{b}(-5; y)$ vektorlar

kolle near bo'lsa

$$x + y = ?$$

kolle near = parallel

$$-\frac{x}{-5} = \frac{2}{y} \Rightarrow xy = -10$$

$$2xy + 15 = -20 + 15 = -5$$

14. $f(x) = \arcsin(3-2x)$

$$f^{-1}(x) = ?$$

toping

$$(f^{-1}(x) - f(x)) \text{ ga}$$

teskari funksiya

x va f(x) larini

ornini almashtiramiz:

$$x = \arcsin(3-2f^{-1}(x))$$

$$3-2f^{-1}(x) = \sin x$$

$$f^{-1}(x) = \frac{3}{2} - \frac{1}{2} \sin x$$

15. $2x^3 - 34x - 9x^2 + \frac{a^2}{3} = 0$

3 ta ildiz qaram-

qarshi va 3 ta ildiz bor

bo'lsa $a^2 + 3 = ?$ $x_1 = -x_2$

$$x_1 + x_2 + x_3 = 2 \Rightarrow x_3 = 2$$

$$2 \cdot 2^3 - 34 \cdot 2 - 9 \cdot 2^2 + \frac{a^2}{3} = 0$$

$$a = 6 \quad a^2 + 3 = 39$$