

2019

11-SINF MATEMATIKA



$$\text{Eslatma: } \frac{a}{b} = \frac{a}{b}$$

$$a^x = a^x$$

1-bilet

1. Tenglamani yeching $\sin x = \cos x$

$$\frac{\sin x}{\sin x} = \frac{\cos x}{\sin x} \rightarrow 1 = \operatorname{ctg} x \rightarrow x = \frac{\pi}{4} + \pi k \quad k \in \mathbb{Z}$$

$$2. \log_2(3x + 1) > \log_2(x - 1)$$

$$\begin{cases} 3x + 1 > 0 \\ x - 1 > 0 \end{cases} \rightarrow \begin{cases} 3x > -1 \\ x > 1 \end{cases} \rightarrow \begin{cases} x > -\frac{1}{3} \\ x > 1 \end{cases}$$

$$3x + 1 > x - 1$$

$$2x > -2$$

$$x > -1 \quad \text{Javob: } x > 1$$

$$3 \quad s(t) = 30t - 16t^2 \quad v = 30 \text{ m/s}$$

$$s'(t) = v(t) \quad s'(t) = 30 - 32t$$

$$v(t) = 0 \quad 30 - 32t = 0 \rightarrow t = 15/16 \text{ s}$$

$$s(15/16) = 30 \cdot 15/16 - 16 \cdot \frac{15^2}{16} = 225/16 \text{ m}$$

$$4 \quad a = 13 \text{ sm} \quad b = 14 \text{ sm} \quad c = 15 \text{ sm} \quad h = 14 \text{ sm}$$

$$r = \frac{2S}{a+b+c} \quad p = \frac{13+14+15}{2} = 21$$

$$S = \sqrt{p(p-a)(p-b)(p-c)} = \sqrt{21(21-13)(21-14)(21-15)} = 84$$

$$r = \frac{2 \cdot 84}{13+14+15} = 4 \quad h^2 = r^2 + H^2 \rightarrow H = 6\sqrt{5}$$

$$\text{Javob; } H = 6\sqrt{5}$$

$$5 \quad S=9 \text{ sm}^2$$

$$9=\frac{1}{2}2R^*R \quad R=3 \quad V=\frac{4}{3}\pi R^3=\frac{4}{3}\pi 3^3=36\pi \quad \text{Javob; } V=36$$

2 Bilet

$$1 \quad \log_2(x-5) + \log_2(x+2) = 3$$

$$\log_2(x-5)(x+2)=3$$

$$x^2-3x-10=8 \rightarrow x=6 \quad x=-3$$

Javob; $x=6$

$$2 \quad \sin 2x \geq \frac{1}{2}$$

$$\frac{\pi}{12} + 2\pi k \leq x \leq \frac{5\pi}{12} + 2\pi k$$

$$3 \quad S(t)=40t-16*t^2 \quad v=40 \text{ m/h}$$

$$S'(t)=V(t) \quad S'(t)=40-32t$$

$$V(t)=0 \quad 40-32t=0 \rightarrow t=\frac{5}{4} \text{ s}$$

$$S(\frac{5}{4})=40*\frac{5}{4}-16*\frac{5^2}{4}=25 \text{ m}$$

$$4 \quad \alpha = 60^\circ \quad \beta = 45^\circ$$

$$\sin 30^\circ = \frac{x}{a} \quad \sin 45^\circ = \frac{x}{b}$$

$$x=\sin 30^\circ*a \quad X=\sin 45^\circ*b$$



$$\frac{1}{2}*a=\frac{\sqrt{2}}{2}*b \quad a=\sqrt{2}*b$$

$$5 \quad R=13 \quad h=10 \quad x=?$$

$$x=\sqrt{R^2-h^2} \quad x=\sqrt{13^2-10^2}=\sqrt{69}$$

3 Bilet

$$1 \quad 12^x+27^x=2*8^x$$

$$\frac{12^x}{12^x}+\frac{27^x}{12^x}=\frac{2*8^x}{12^x}$$

$$1+\frac{3^{2x}}{2}=2*\frac{2^x}{3} \quad \frac{2^x}{3}=a$$

$$1+\frac{1}{a^2}=2*a \rightarrow a=1 \quad x=0$$

$$2 \quad \cos 3x \geq \frac{1}{2}$$

$$-\frac{\pi}{3} \leq 3x \leq \frac{2\pi}{3} \rightarrow -\frac{\pi}{9} \leq x \leq \frac{2\pi}{9}$$

$$3 \quad S(t)=24t-16*t^2 \quad v=24 \text{ m/h}$$

$$S'(t)=V(t) \quad S'(t)=24-32t \rightarrow t=\frac{3}{4} \text{ s}$$

$$V(t)=0 \quad s(\frac{3}{4})=24*\frac{3}{4}-16*\frac{3}{4}^2=9 \text{ m}$$

$$4 \quad a=13 \quad d=10 \quad h=?$$

$$h^2=a^2-\frac{d^2}{2} \quad h=\sqrt{13^2-\frac{10^2}{2}}=12 \quad h=12$$

$$5 \quad s_1=100 \text{ sm}^2 \quad s_2=40 \text{ sm}^2$$

$$100=\pi R^2$$

$$40=2R*h \rightarrow R=\frac{10}{\sqrt{\pi}} \quad h=2*\sqrt{\pi}$$

$$V=\pi R^2 h=\pi*\frac{10}{\sqrt{\pi}}*\frac{10}{\sqrt{\pi}}*2*\sqrt{\pi}=200\sqrt{\pi}$$

4 bilet

$$1. \quad \tan^2 x+3*\tan x-2*\sqrt{3}=0 \quad \tan x=a$$

$$a^2+3a-2*\sqrt{3}=0 \rightarrow a=\frac{-3-\sqrt{9+8*\sqrt{3}}}{2}; a=\frac{-3+\sqrt{9+8*\sqrt{3}}}{2}$$

$$\tan x = \frac{-3 - \sqrt{9 + 8\sqrt{3}}}{2} \rightarrow$$

$$\tan x = \frac{-3 + \sqrt{9 + 8\sqrt{3}}}{2} \rightarrow$$

$$2 \quad \log_{0.5}(2x + 3) \leq \log_{0.5}(4x - 1)$$

$$2x + 3 \geq 4x - 1 \rightarrow 4 \geq 2x \quad 2 \geq x$$

$$\begin{cases} 2x + 3 > 0 \\ 4x - 1 > 0 \end{cases} \rightarrow \begin{cases} 2x > -3 \\ 4x > 1 \end{cases} \rightarrow \begin{cases} x > \frac{-3}{2} \\ x > \frac{1}{4} \end{cases} \quad \text{Javob; } \left(\frac{1}{4} \mid 2\right)$$

$$3 \quad R=41 \quad h=9 \quad x=?$$

$$x = \sqrt{R^2 - h^2} \quad x = \sqrt{41^2 - 9^2} = \sqrt{1600} = 40$$

$$\text{Javob; } x=40$$

$$4. \quad x \in (1 \mid 3) ; f(x) = \frac{1}{2}x^2 - \frac{1}{3}x^3$$

$$f'(x) = x - x^2 \rightarrow x=0 ; x=1$$

$$f(0)=0 \quad f(1)=\frac{1}{6} \quad f(3)=-\frac{9}{2}$$

$$\text{Javob; } f(1)=\frac{1}{6}$$

$$5 \quad S_1=60\pi \quad S_2=96\pi \quad S_{\text{asos}}=36\pi \quad R=6$$

$$60\pi = \pi R L \quad L=10 \quad L^2 = R^2 + H^2 \quad H = \sqrt{L^2 - R^2} = 8$$

$$V = \frac{1}{3} \pi R^2 H = \frac{1}{3} \pi * 36 * 8 = 96\pi$$

$$5 \text{ Bilet}$$

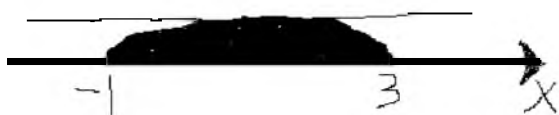
$$1 \quad 4 \sin^2 x + \sin x - 1 = 0 \quad \sin x = a$$

$$4a^2 + a - 1 = 0 \quad a = \frac{-1 - \sqrt{17}}{8} ; \frac{-1 + \sqrt{17}}{8}$$

$$\sin x = \frac{-1 - \sqrt{17}}{8} ; \sin x = \frac{-1 + \sqrt{17}}{8} ;$$

$$2 \quad 4^x < 2^{x+1} + 3 \quad 2^x = a$$

$$a^2 < 2a + 3 \rightarrow (a-3)(a+1) < 0$$



$$-1 < 2^x < 3 \quad x = (\infty; \log_2 3)$$

$$3 \quad S(t) = 26t - 16t^2 \quad v = 26 \text{ m/s}$$

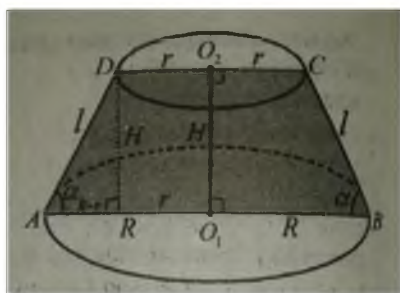
$$S'(t) = V(t) \quad S'(t) = 26 - 32t \rightarrow t = \frac{13}{16} \text{ s}$$

$$V(t) = 0 \quad s\left(\frac{13}{16}\right) = 24 \cdot \frac{13}{16} - 16 \cdot \left(\frac{13}{16}\right)^2 = 8.9375 \text{ m}$$

$$4 \quad a = 13 \quad d = 10 \quad h = ?$$

$$h^2 = a^2 - \frac{d^2}{2} \quad h = \sqrt{13^2 - \frac{10^2}{2}} = 12 \quad h = 12$$

5



$$\tan \alpha = \frac{H}{R-r} \quad H = \tan \alpha \cdot (R-r)$$

$$V = \frac{H}{3} \pi (R^2 + r^2 + Rr) = \frac{\tan \alpha \cdot (R-r)}{3} \pi (R^2 + r^2 + Rr)$$

6 Bilet

$$1 \quad \log_2 x - 2 \cdot \log_x 2 = -1 \quad \log_2 x = a$$

$$a - 2 \cdot \frac{1}{a} = -1 \quad a^2 + a - 2 = 0 \quad a = -2; a = 1$$

$$\log_2 x = -2 \quad x = \frac{1}{4}; \log_2 x = 1 \quad x = 2$$

$$2 \quad \sin 3x \geq \frac{\sqrt{3}}{2}$$

$$\frac{\pi}{3} \leq 3x \leq \frac{2\pi}{3} \rightarrow \frac{\pi}{9} \leq x \leq \frac{2\pi}{9}$$

$$3 \quad R = 13 \quad h = 12 \quad x = ?$$

$$x = \sqrt{R^2 - h^2} \quad x = \sqrt{13^2 - 12^2} = \sqrt{25} = 5$$

Javob ;x=5

$$4. \int \frac{8}{(5z+4)^2} dz = \frac{24}{5 \cdot (5z+4)^3}$$

$$\int \frac{-3}{\sin^2(2x-3)} + \frac{1}{3} = \frac{-3}{2} \cdot \operatorname{ctg}(2x-3) + \frac{1}{3} \cdot x$$

$$5 \quad a=9 \quad b=12 \quad l=12.5 \quad V=?$$

$$h^2 = a^2 - \frac{d^2}{2} \quad h = \sqrt{12.5^2 - \frac{15^2}{2}} = 12 \quad h=10$$

$$V = \frac{1}{3} a \cdot b \cdot h = \frac{1}{3} \cdot 9 \cdot 12 \cdot 10 = 360$$

7 Bilet

$$1 \quad 0.5 \cdot \log(x^2 - 4x - 1) = \log(8x) - \log(4x)$$

$$x^2 - 4x - 1 = 4 \quad x^2 - 4x - 5 = 0 \quad x=5 \quad ; \quad x=-1$$

$$2 \quad \cos 3x \leq -1$$

$$x \left(-\frac{\pi}{3} + \frac{2\pi k}{3}; \frac{\pi}{3} + \frac{2\pi k}{3} \right)$$

$$3 \quad p=54 \text{ sm} \quad 3 \cdot a=p \quad a=18 \quad P=?$$

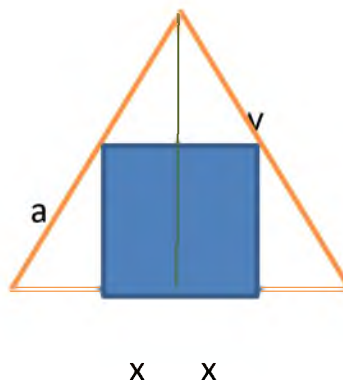
$$2x=y \quad \operatorname{tg} 30^\circ = \frac{9-x}{x} \quad x = \frac{27}{2\sqrt{3}+3} \quad P=4x=4 \cdot \frac{27}{2\sqrt{3}+3}$$

$$4 \quad y=2 \cdot x^4 - x \quad y'=8x^3 - 1 \quad x=1/2$$

$$5 \quad h=5 \text{ sm} \quad H=4 \text{ sm} \quad V=36 \cdot \pi$$

$$V=36 \cdot \pi = \pi R^2 (h+H) \quad R=2/3$$

$$S=2 \cdot \pi \cdot R \cdot (H+h) = 2 \cdot \pi \cdot 2/3 \cdot 9 = 12 \cdot \pi$$



8 Bilet

$$1. \quad \tan x + \sqrt{3} \cdot \operatorname{ctg} x = 2 \cdot \sqrt{3} \quad \tan x = a$$

$$a + \sqrt{3} \cdot 1/a = 2 \cdot \sqrt{3} \quad a \neq 0 \rightarrow a = \frac{2 \cdot \sqrt{3} - \sqrt{12 - 4 \cdot \sqrt{3}}}{2}; \quad a = \frac{2 \cdot \sqrt{3} + \sqrt{12 - 4 \cdot \sqrt{3}}}{2}$$

$$\tan x = \rightarrow \frac{2 \cdot \sqrt{3} - \sqrt{12 - 4 \cdot \sqrt{3}}}{2}$$

$$\tan x \rightarrow \frac{2\sqrt{3} + \sqrt{12 - 4\sqrt{3}}}{2}$$

$$2. \quad \log_8(x^2 - 4x + 3) < 1$$

$$x^2 - 4x + 3 < 8 \quad x^2 - 4x - 5 < 0 \quad (x-5)(x+1) < 0$$

$$x \in (-1; 5)$$

$$3. \quad L = \sqrt{3} \quad \alpha = 60^\circ \quad a = 3 * \sqrt{3}$$

$$R = a / \sqrt{3} = 3 * \sqrt{3} / \sqrt{3} \quad R = 3$$

$$4 \quad f(x) = x^{\frac{2}{3}} * (10 - x) \quad f'(x) = \frac{2}{3} * x^{-\frac{1}{3}} (10 - x) + x^{\frac{2}{3}} * (-1)$$

$$f'(x) = 0 \quad x = 0$$

$$5 \quad s = \frac{2}{\sqrt{\pi}} \quad \frac{2}{\sqrt{\pi}} = 4 * R^2 \quad \frac{1}{2\sqrt{\pi}} = R^2$$

$$V = \pi R^2 * 2 * R = \pi * \frac{1}{2\sqrt{\pi}} * 2 * \sqrt{\frac{1}{2\sqrt{\pi}}} = \sqrt{\frac{1}{2\sqrt{\pi}}} * \pi$$

9 Bilet

$$1. \quad 2 \cos^2 x + \cos x - 1 = 0 \quad \cos x = a$$

$$2 * a^2 + a - 1 \quad a = 1/2; a = -1 \quad \cos x = -1 \quad x = \pi + \pi k$$

$$\cos x = 1/2 \quad x = \frac{\pi}{3} + 2 * \pi * k$$

$$2. \quad 9^x < 8 * 3^x + 9 \quad 3^x = a$$

$$a^2 < 8 * a + 9 \quad (a-9) * (x+1) < 0 \quad -1 < 3^x < 9$$

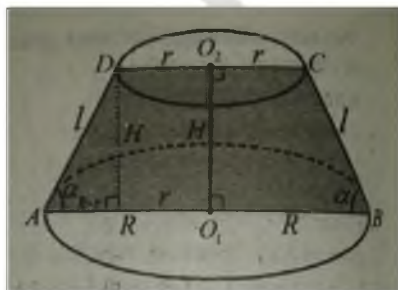
$$\text{Javob ; } x \in (-\infty; 2)$$

$$3 \quad a = 10; b = 4 \quad f = 4$$

$$S_1 = 3/2 * (a+b) * f = 3/2 * (10+4) * 4 = 84$$

$$\text{Stola} = 3/2 * (a+b) * f + a^2 * \sqrt{3}/4 + b^2 * \sqrt{3}/4 = 84 + \sqrt{3}/4 (100 + 49) = 84 + \sqrt{3}/4 * 149$$

$$4. \quad f(x) = \int \sqrt[5]{(4x - 5)^3} dx = 5/32 * (4x - 5)^{8/5}$$



$$5 \quad S = \frac{6}{\sqrt{\pi}} \quad \frac{6}{\sqrt{\pi}} = (2R)^2 * \sqrt{3}/4 \quad R^2 = \frac{2}{\sqrt{\pi}} * \sqrt{3}$$

$$V = \frac{1}{3} \pi R^2 H = \frac{1}{3} \pi * \frac{2}{\sqrt{\pi}} * \sqrt{3} * \sqrt{3} * \frac{2}{\sqrt{\pi}} * \sqrt{3}/4 = 3 * \sqrt{3}$$

10 Bilet

1 $\lg(x-1) = \lg(x+1)$ yechim yo'q

2 $\cos 3x > 1$
 $3x > 2k\pi \quad x > 2k\pi/3$

3 $h=2 \quad a=3 \quad b=5 \quad d=?$
 $d = \sqrt{a^2 + b^2} = \sqrt{3^2 + 5^2} = \sqrt{34}$

4 $\int \sqrt{(7x-1)^3} = 2/35 * (7x-1)$

5 $S = 12 \quad \alpha = 60^\circ$

$$12 = 1/2 * 2r * h \quad r * h = 12 \quad \tan 60^\circ = h/r$$

$$r * \tan 60^\circ * r = 12 \quad r^2 = 4 * \sqrt{3} \quad h = 12$$

$$V = \frac{1}{3} \pi R^2 H = \frac{1}{3} \pi * 48 * 12 = 192$$

11 Bilet

1 $(x-3)^{3*x^2-10*x+3} = 1$

$$3*x^2 - 10x + 3 = 0 \quad x=3; \quad x=1/3$$

Javob $x=1/3$

2. $\cos 2x < -1/2$

$$2*\pi/3 < 2x < 4*\pi/3 \quad \pi/3 < x < 2\pi/3$$

3. $a=12 \quad \alpha = 45^\circ \quad R=H$

$$H^2 = L^2 - (R/2)^2 \quad 2*R^2 = L^2 \quad H = 4\sqrt{3}$$

4 $\int \sqrt[6]{(4-3x)^5} = 6/-33 * (4-3x)^{11/6}$

5 $s = \frac{2}{\sqrt{\pi}} \quad \frac{2}{\sqrt{\pi}} = 4 * R^2 \quad \frac{1}{2\sqrt{\pi}} = R^2$

$$V = \pi R^2 2 * R = \pi * \frac{1}{2\sqrt{\pi}} * 2 * \sqrt{\frac{1}{2\sqrt{\pi}}} = \sqrt{\frac{1}{2\sqrt{\pi}}} * \pi$$

12 Bilet

- 1 $\log_x 25 - 3 \cdot \log_{25} x = 1$ $\log_{25} x = a$
 $1/a - 3 \cdot a = 1$ $3 \cdot a^2 + a - 1 = 0$
 $a = \frac{-1 + \sqrt{17}}{6}$ $a = \frac{-1 - \sqrt{17}}{6}$
 $\log_{25} x = \frac{-1 - \sqrt{17}}{6}$ $x = 25^{\frac{-1 - \sqrt{17}}{6}}$
- 2 $\cos x + 2.5 > 0$ $\cos x > -2.5$ x cheksiz ko'p yechim
- 3 $d_1 = 6$ $d_2 = 8$ $h = 1$
 $a = \sqrt{17}$ $b = \sqrt{10}$ $S = a \cdot b \sin \alpha / 2 = \sqrt{170}$
- 4 $\int \sqrt[n]{(ax + b)} = n/a \cdot (ax + b)^{1/n} + C$
- 5 $a = 3 \cdot \sqrt{3}$ $h = 5$ $a = 2R$ $Stola = \pi \cdot r \cdot h + 2 \cdot \pi \cdot R^2 = 3 \cdot \sqrt{3} \cdot \pi \cdot 5 + 2 \cdot \pi \cdot 27/4 = \pi(15\sqrt{3} + 27/2)$

13 Bilet

- 1 $2 \cdot \log_x 27 - 3 \cdot \log_{27} x = 1$ $\log_x 27 = a$
 $2 \cdot a - 3/a = 1$ $2 \cdot a^2 - a - 3 = 0$ $a = 1.5$; $a = -2$
 $\log_x 27 = -2$ $x = 3^{-3/2}$
 $\log_x 27 = \frac{3}{2}$ $x = 9$
- 2 $\lg x + 1 > 0$ $\lg x > -1$
 $(-\pi/4 + \pi k; \frac{\pi}{2} + \pi k)$
- 3 $S(t) = 35t - 16 \cdot t^2$ $v = 35 \text{ m/s}$
 $S'(t) = V(t)$ $S'(t) = 35 - 32t$
 $V(t) = 0$ $35 - 32t = 0 \rightarrow t = 35/32 \text{ s}$
 $S(35/32) = 30 \cdot 35/32 - 16 \cdot \frac{35^2}{32} = 875/64$
- 4 $x \in [-3; 1]$ $f(x) = 3 \cdot x^4 - 16 \cdot x^3 + 2$

$$F'(x) = 12x^3 - 48x^2 \quad x=0 \quad x=-4 \quad f(0)=2$$

$$F'(-3)=1051 \quad F'(1)=-11$$

$$5 \quad Stola = \pi RH + 2\pi R^2 = 24\pi$$

$$2RH + 2R^2 = 24 \quad V = \pi R^2 H = \pi R^2 (12 - R^2) / R = R\pi (12 - R^2)$$

$$H = (12 - R^2) / R \quad V' = 0$$

14 Bilet

$$1 \quad 2 \log_4 x + 2 \log_x 4 = 5 \quad \log_4 x = a$$

$$2a + 2/a = 5 \quad a=2; \quad a=1/2$$

$$\log_4 x = 2 \quad x=16; \quad \log_4 x = 1/2 \quad x=2$$

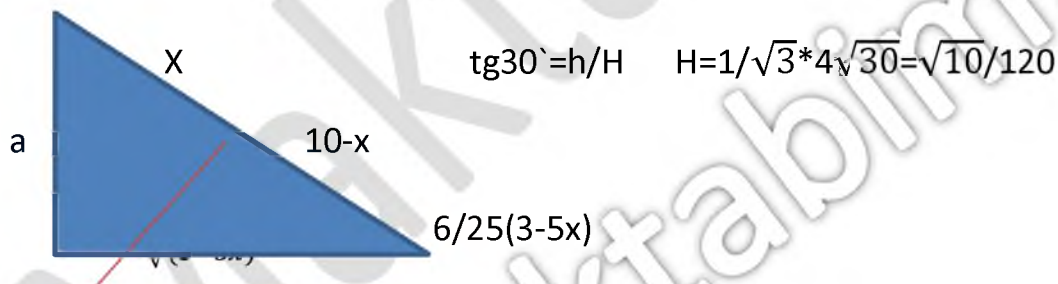
$$2 \quad 1 - 2\sin 4x < \cos^2 4x$$

$$\sin^2 4x - 2\sin 4x < 0$$

$$\pi + \pi k < 4x < 2\pi k \quad k \in \mathbb{Z}$$

$$\frac{\pi}{4} + \frac{\pi k}{4} < x < \frac{\pi k}{2}$$

$$3. \quad a=6 \quad b=8 \quad \alpha = 60^\circ \quad H=? \quad x=32/15 \quad h=(4\sqrt{30})/5$$



$$\operatorname{tg} 30^\circ = h/H \quad H = 1/\sqrt{3} \cdot 4\sqrt{30} = \sqrt{10}/120$$

$$5 \quad h=8\text{sm} \quad a=6\text{sm} \quad V=?$$

$$r = a/2\sqrt{3} \quad r = \sqrt{3} \quad V = \pi R^2 h = \pi \cdot 3 \cdot 8 = 24\pi$$

15 Bilet

$$1 \quad \sin(2x - \pi/2) = 0$$

$$2x - \pi/2 = \pi k \quad x = \frac{\pi}{4} + \pi k/2$$

$$2 \quad \cos(4x + \pi/3) > -\sqrt{3}/2$$

$$\pi/6 + 2\pi k < 4x + \pi/3 < 5\pi/6 + 2\pi k$$

$$5\frac{\pi}{24} + \frac{\pi k}{2} < x < \frac{\pi}{8} + \frac{\pi k}{2}$$

3 $R=41$ $h=9$ $x=?$

$$x = \sqrt{R^2 - h^2} \quad x = \sqrt{41^2 - 9^2} = \sqrt{1600} = 40$$

Javob ; $x=40$

4 $R = \frac{\sqrt{3}}{2}$ $S = \frac{\sqrt{3}}{2} \pi$

$$S = \frac{\sqrt{3}}{2} \pi = \pi R l \quad L=1 \quad h=1/2$$

16 Bilet

1 $\cos 3x \cdot \cos x - \sin 3x \cdot \sin x = -1/2$

$$\cos(4x) = -1/2 \quad x = \frac{\pi}{6} + \frac{\pi k}{2}$$

2 $\cos(x - \frac{\pi}{6}) > -\frac{\sqrt{2}}{2}$

$$-\pi/4 + 2\pi k < x - \frac{\pi}{6} < \frac{\pi}{4} + 2\pi k$$

$$-\frac{\pi}{12} + 2\pi k < x < \frac{5\pi}{12} + 2\pi k$$

3 $V=2520$ $S=168$

$$V = Sh = 2520 \quad h=15 \quad a(a+2)=168 \quad a=12 \quad a+2=b=14$$

4 $\int \frac{2}{(3x-2)^2} + \frac{2}{3x-2} + 3x+2 = 2/3 \cdot (3x-2) + 2/3 \ln(3x-2) + 3x^2/2 + 2x$

5 $h=3$ $r=3\sqrt{3}$ $R^2 = (h-R)^2 + r^2$ $R=6$

$$V = 4/3 \pi R^3 = 4/3 \pi 216 = 288\pi$$

17 bilet

1. $\sin 5x \cdot \cos 2x - \cos 5x \sin 2x = -1$

$$\sin 3x = -1 \quad 3x = -\frac{\pi}{2} + 2\pi k \quad x = -\frac{\pi}{6} + \frac{2\pi k}{3}$$

2 $\sin(3x + 3\frac{\pi}{8}) < \frac{\sqrt{3}}{2}$

$$-\pi - \frac{\pi}{3} + 2\pi < 3x + 3\frac{\pi}{8} < \frac{\pi}{3} + 2\pi k$$

$$-41\frac{\pi}{72} + 2\pi k < x < -\frac{\pi}{72} + 2\pi k$$

$$3 \quad S_1=108; S_2=75; S_3=48 \quad x=? \quad h=24$$

$$(y/h)^2 = S_3/S_1 \quad Y=24*24*48/108=16$$

$$(X+y/h)^2 = S_2/S_1 \quad x+y=20 \quad x=4$$

$$4 \quad f(x)=2(6-5x)^{-3}+4(6-5x)^{-1}$$

$$F(x)=-1/5(6-5X)^{-2}+2/-5(6-5x)^{-2}$$

18 Bilet

$$1 \quad \cos 2x \cdot \sin 3x + \sin 2x \cdot \cos 3x = 1/2$$

$$\sin 5x = \frac{\pi}{6} + 2\pi k$$

$$X = \frac{\pi}{30} + 2\frac{\pi k}{5}$$

$$2 \quad \operatorname{Tg}(x + \pi/6) > 1/\sqrt{3}$$

$$X + \frac{\pi}{6} > \pi/6 + \pi k \quad x > \pi k$$

$$3 \quad a = R^2 \cdot \sqrt{3} \quad S_{\text{asos}} = a^2 \cdot \sin \alpha$$

$$S_{\text{yon}} = S_{\text{asos}} \cdot \cos \beta = a^2 \cdot \sin \alpha \cdot \cos \beta$$

$$4 \quad f(x) = (1-7x)^{4/3} + 8/1-7x$$

$$F(X) = 3/-49(1-7x)^{7/3} + 8/-7 \ln(1-7x)$$

$$5 \quad S=60\pi \quad H=6$$

$$S(\text{yon}) = \pi R l = 60\pi \quad R l = 60 \quad R^2 + 36 = L^2 \quad L = 60/R$$

$$R^2 + 36 = \frac{3600}{R^2} \quad R^4 + 36R^2 = 3600 \quad R^2 = T$$

$$T^2 + 36T = 3600 \quad T = \frac{-36 \pm \sqrt{15696}}{2} \quad R = \sqrt{\frac{-36 \pm \sqrt{15696}}{2}}$$

$$V = \pi R^2 H = \pi \left(\sqrt{\frac{-36 \pm \sqrt{15696}}{2}} \right)^2 \cdot 6 = 6 \cdot \pi \cdot \frac{-36 \pm \sqrt{15696}}{2}$$

19 Bilet

1 $\sin x \cdot \cos 3x + \cos x \cdot \sin 3x = 1$

$$\sin 4x = 1 \quad x = \pi/8 + \frac{\pi k}{2}$$

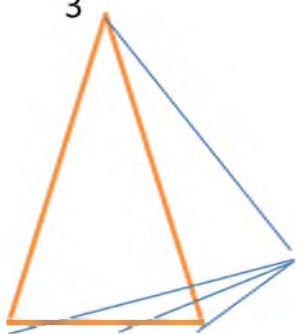
2 $6 \cdot \cos^2 x - 11 \cdot \cos x + 4 > 0 \quad \cos x = a$

$$6a^2 - 11a + 4 > 0 \quad 6(a - 4/3)(a - 1/2) > 0$$

$$\cos x < -1/2 \quad -7\frac{\pi}{6} + 2\pi k < x < 5\pi/6 + 2\pi k$$

3

$$L = m \quad \cos \beta = AC$$



4 $f(x) = \cos(5x + 2)$

$$F(x) = -\sin(5x + 2)/5$$

5 $h = 2 \quad 2\pi r = 2 \quad r = 1/\pi$

$$V = \pi R^2 h = \pi 1/\pi^2 = 2/\pi$$

20 Bilet

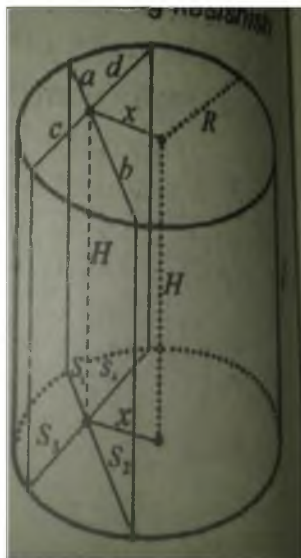
1 $\sqrt{\sin x} \cdot \cos x = 0 \quad x = \pi/2 + 2\pi k; \quad x = \pi k$

2 $2 \cdot \cos^2 x - \cos x - 1 > 0 \quad \cos x = a$

$$2a^2 - a - 1 > 0 \quad 2(a - 1)(a + 1/2) > 0$$

$$\cos x < -1/2 \quad -7\frac{\pi}{6} + 2\pi k < x < 5\pi/6 + 2\pi k$$

2 $h = 8 \quad D = 10 \quad x = 4$

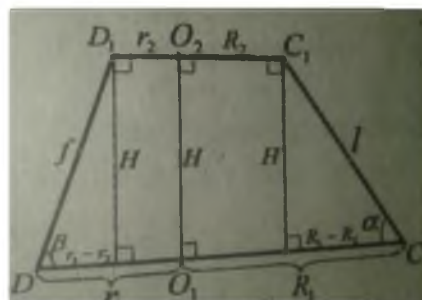


$$d=3 \quad c=16/3 \quad h=8$$

$$S=(c+d)h=25/3 \cdot 8=200/3$$

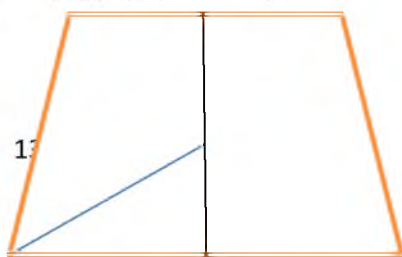
$$4 \quad f(x)=\sin 6x$$

$$F(x)=6 \cdot \cos 6x$$



5

$$1. \quad L=13 \quad r=4$$



$$R^2 = \left(\frac{H}{2}\right)^2 + \left(\frac{a}{2}\right)^2 \quad R = \sqrt{36 + 324} =$$

$$= \sqrt{360}$$

$$V = \frac{4}{3} \pi R^3 = \frac{4}{3} \pi = \sqrt{3600}$$

21 Bilet

1 $\sin^2 x = 1/4$

$$\frac{1 - \cos 2x}{2} = 1/4 \quad 1 - \cos 2x = 1/2$$

$$\cos 2x = 1/2$$

$$2x = \pi/3 + 2\pi k$$

$$x = \frac{\pi}{6} + \pi k$$

2 $y = \sqrt[4]{1 + \cos^2 x}$

$$y' = \sqrt[4]{1 + \frac{1 + \cos 2x}{2}} = \sqrt[4]{\frac{3 + \cos 2x}{2}} = 1/4(-\sin 2x)(3 + \cos 2x)/\sqrt{2}$$

3 $S = (\pi r^2 / 360) * 60 * h = \pi r^2 h / 60 = 3h * \pi r^2$

4 $f(x) = 2 * (6 - 5x)^{-3} + 4 * (6 - 5x)^{-1}$

$$F(x) = 30(6 - 5x)^{-2} + 20(6 - 5x)^{-2}$$

5 $a=10 \quad b=14 \quad d=18$

22-bilet

1. $2\sin^2 x + \sin x - 1 = 0 \quad \sin x = a$

$$2a^2 + a - 1 = 0 \quad a = -1 \quad a = 1/2$$

$$\sin x = -1 \quad x = -\pi/2 + 2\pi k$$

$$\sin x = 1/2 \quad x = \pi/6 + 2\pi k$$

2. $y = (1 + \sqrt[3]{x})^2 = 1 + 2\sqrt[3]{x} + \sqrt[3]{x^2}$

$$y' = 2/3 * x^{-2/3} + 2/3 * x^{-1/3}$$

3. $a=2 \quad \alpha = 60^\circ \quad r = a/\sqrt{3} = 2/\sqrt{3} \quad h = 2 * r = 4/\sqrt{3}$

$$S = 3 * 1/2 * a * h = 3 * 1/2 * 2 * 4/\sqrt{3} = 4\sqrt{3}$$

4. $f(x) = (1 - 7 * x)^{-4/3} + \frac{8}{1 - 7 * x}$

$$F(x) = -3/7 (1 - 7x)^{-1/3} + 8 / -7 * \ln(1 - 7x)$$

5 $a/b = 3/4 \quad S = 40$

$$\sqrt{a^2 + b^2} \cdot h = 40$$

$$5bh = 400 \quad bh = 80 \quad ah = 60$$

$$S = 2ah + 2bh = 2 \cdot 80 + 2 \cdot 60 = 280$$

23 Bilet

$$1. \quad 2\sin^2 x = 1/3 \sin 4x + 1 = 0 \quad \sin x = a$$

$$3 - 3\cos 2x = 3 + 2 \cdot \sin 2x \cdot \cos 2x \quad 2 \cdot \sin 2x \cdot \cos 2x + 3\cos 2x = 0$$

$$\cos 2x (2\sin 2x + 3) = 0$$

$$\cos 2x = 0 \quad x = \frac{\pi}{4} + \pi k / 2$$

$$2 \quad y = \ln \sqrt{x^2 - 2x}$$

$$y' = \frac{2x-2}{x^2-2x}$$

$$3 \quad S = a^2 \sqrt{3}/4 \quad S_{\text{yon}} = a \quad S_1 = a^2 \sqrt{3}/4 \cdot \cos \alpha$$

$$S_{\text{toila}} = a^2 \sqrt{3}/4 + a + a^2 \sqrt{3}/4 \cdot \cos \alpha$$

$$4 \quad f(x) = (2x-7)^3$$

$$F(x) = 1/8 (2x-7)^4$$

$$5 \quad S_{\text{yon}} = 4 \cdot 1/2 ah = 160 \quad S_{\text{asos}} = a^2 = 50 \quad a = 5\sqrt{2}$$

$$H = 8\sqrt{2} \quad V = S_{\text{asos}} \cdot h = 50 \cdot 8\sqrt{2} = 400\sqrt{2}$$

24 Bilet

$$1 \quad \sin 2x + 4(\sin x + \cos x) + 4 = 0$$

$$(\sin x + \cos x)^2 - 1 + 8(\sin x + \cos x) + 8 = 0 \quad (\sin x + \cos x) = a$$

$$a^2 + 8a + 7 = 0 \quad a = -7; a = -1$$

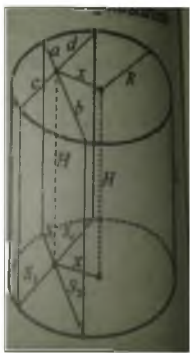
$$(\sin x + \cos x) = -1$$

$$\sin x = -1 \quad x = -\frac{\pi}{2} + 2\pi k$$

$$\cos x = 0 \quad x = \pi k \quad k \in \mathbb{Z}$$

$$2 \quad y = \sqrt[3]{\sin^2 4x}$$

$$Y' = \frac{\sqrt[3]{1+\cos 8x}}{\sqrt[3]{2}} = (-12 \sin 8x (1+\cos 8x)^{4/3})^{2/3}$$



$$3 \text{ Sasos} = 8 \text{ m}^2 \quad S_{o'q} = 8$$

$$S_{asos} = 8 = \pi R^2 \quad R^2 = 8/\pi \quad 2 * R * H = 8 \quad R * H = 4 \quad H = \frac{2 * \sqrt{\pi}}{\sqrt{2}} = \sqrt{2\pi}$$

$$C = d = \sqrt{R^2 - X^2} = \sqrt{\frac{8-\pi}{\pi}} \quad c+d = 2 * \sqrt{\frac{8-\pi}{\pi}} \quad S = (c+d) * H = 2 * \sqrt{\frac{8-\pi}{\pi}} * \sqrt{2\pi} = 2 * \sqrt{2(8-\pi)}$$

$$4 \quad f(x) = \frac{4}{(4x-3)^3}$$

$$F(x) = \frac{1}{-2(4x-3)^2}$$



$$a=8 \quad b=10 \quad S_{tola} = 620 \text{ cm}^2 \quad \alpha = 30^\circ$$

$$S_{asos} = a * b * \sin \alpha = 8 * 10 * 1/2 = 40$$

$$S_{tola} = 2 * S_{asos} + 2 * S_{yon} + 2 * S_{yon} = 2 * 40 + 2 * 10 * h + 2 * 8 * h$$

$$*h = 620$$

$$h = 15 \text{ cm}$$

$$V = a * b * \sin \alpha * h$$

$$V = 10 * 8 * 1/2 * 15$$

$$V = 600 \text{ cm}^3$$

25-bilet

$$1 \quad \sin 2x + 3 = 3 \sin x + 3 \cos x$$

$$\sin 2x + 3 = 3(\sin x + \cos x)$$

$$B: \sin x + \cos x = a$$

$$(\sin x + \cos x)^2 - 1 + 3 = 3(\sin x + \cos x)$$

$$a^2 - 1 + 3 = 3a$$

$$a^2 - 3a + 2 = 0$$

$$(a-1) * (a-2) = 0$$

$$a=1 \quad a=2$$

$$\sin x + \cos x = 1$$

$$\sin x + \cos x = 2 \quad \emptyset$$

$$\sqrt{1 - \cos^2 x} = (1 - \cos x)^2$$

$$(\sqrt{1 - \cos^2 x})^2 = (1 - \cos x)^2$$

$$1 - \cos^2 x = 1 - 2\cos^2 x + \cos^4 x$$

$$\cos^4 x - 2\cos^2 x + \cos^2 x + 1 - 1 = 0$$

$$\cos^4 x - \cos^2 x = 0$$

$$\cos^2 x (\cos^2 x - 1) = 0$$

$$1. \cos^2 x = 0$$

$$2. \cos^2 x - 1 = 0$$

$$x = \frac{\pi}{2} \gamma + \pi k \quad k \in \mathbb{Z}$$

$$\cos^2 x = 1$$

$$\frac{1 + \cos 2x}{2} = 1, \quad \cos 2x = 1, \quad x = \frac{2\pi k}{2}, \quad x = \pi k \quad k \in \mathbb{Z}$$

$$2 \quad y = 2x^4 - x \quad y' = 8x^3 - 1 = (2x - 1)(4x^2 + 2x + 1)$$

$$1) 2x - 1 = 0 \quad 2) (4x^2 + 2x + 1)$$

$$x = 1/2 \quad D < 0 \quad \emptyset$$

$$3 \quad AD = 4$$

$$DC = 8$$

$$CC_1 = 6$$

$$4 \quad f(x) = \frac{7}{(cx+d)^n}$$

$$2) f(x) = \frac{4}{\cos^2(4x-3)} + d$$

5. 7-biletning 5-sida takrorlangan.

26-bilet

$$1. \quad 2 \sin^2 x + \sin x = 0$$

$$\sin x(2\sin x + 1) = 0$$

$$\sin x = 0 \quad \sin x = -1/2$$

$$x = \pi k \quad x = (-1)^{k+1} \frac{\pi}{6} + \pi k$$

$$2. \quad Y = \frac{(x^3 - 1)^4}{(x^2 + 4x + 7)^5}$$

$$Y' = \frac{12x^2(x^3 - 1)^3(x^2 + 4x + 7)^5 - (x^3 - 1)^4 * 5(2x + 4)(x^2 + 4x + 7)^4}{(x^2 + 4x + 7)^5}$$

$$3. \quad a = \text{asos} \quad b = \text{yon qirra} \quad R = \frac{a}{2\sqrt{3}} \quad H^2 = b^2 - R^2 \quad H = \sqrt{b^2 - \frac{a^2}{12}}$$

$$4. \quad a) \quad f(x) = \sqrt[5]{(4x - 5)^3} \quad F(x) = \sqrt[5]{(4x - 5)^8} * 5/32 + C$$

$$f(x) = e^{4x} + 4 \quad F(x) = 4 * e^{4x} + 4x + C$$

$$5. \quad a = \frac{6}{\sqrt{\pi}} \quad V =$$

$$H = \frac{3\sqrt{3}}{\sqrt{\pi}} \quad R = \frac{3}{\sqrt{\pi}} \quad V = 1/3 * \pi R^2 H = 1/3 * \pi * \frac{3}{\sqrt{\pi}} * \frac{3\sqrt{3}}{\sqrt{\pi}} = \frac{3\sqrt{3}}{\sqrt{\pi}}$$

27-bilet

$$1. \quad \int_{\frac{\pi}{4}}^{\pi} \cos(3x - \frac{\pi}{4}) dx = \frac{-\sin(3x - \frac{\pi}{4})}{3} = -\frac{\sqrt{2}}{6} - \frac{1}{3} = -\frac{\sqrt{2}-2}{6}$$

$$2. \quad 0.1 * x^{\lg x - 4} = 100^2$$

$$(\lg x - 4) \lg x = 5 \quad \lg x = a \quad a^2 - 4a - 5 = 0$$

$$a = 5 \quad \lg x = 5 \quad x = 100000 \quad a = -1 \quad \lg x = -1 \quad x = 0.1$$

$$3. \quad V(\text{shar}) = 4/3 * \pi = 4/3 * \pi R^3 \quad R = 1 \quad H = 3$$

$$\frac{R}{1} = \frac{3}{\sqrt{3}} \quad R = \sqrt{3} \quad V(\text{konus}) = 1/3 * \pi R^2 H = 1/3 * \pi * 3 * 3 = \pi 3$$

$$4. \quad \vec{a}(1; 2; -1) \quad \text{va} \quad \vec{b}(-3; 4; 0) \quad 2 * \vec{a} + 3 * \vec{b} \quad \text{va} \quad \vec{a} - 2 * \vec{b} \quad \alpha = ?$$

$$\vec{a} - 2 * \vec{b} = (1; 2; -1) - (-6; 8; 4) = (7; -6; -5) \quad 2 * \vec{a} = (2; 4; -2) \quad 3 * \vec{b} = (-9; 12; 6) \quad 2 * \vec{b} = (-6; 8; 0)$$

$$2 * \vec{a} + 3 * \vec{b} = (2; 4; -2) + (-9; 12; 6) = (-7; 16; 4)$$

$$\cos \alpha = \frac{\vec{a} * \vec{b}}{|\vec{a}| * |\vec{b}|} = \frac{-7 * 7 + (-16 * (-6) + 8 * (-5))}{\sqrt{49 + 36 + 25} * \sqrt{49 + 256 + 64}} = \frac{7}{\sqrt{110} * \sqrt{369}}$$

$$5. \quad H = 3 \quad a = 4 \quad V = ?$$

$$R = \frac{a}{2\sqrt{3}} = \frac{4}{2\sqrt{3}} \quad V = \pi R^2 H = 4/3 * 3\pi = 4\pi$$

28-bilet

$$1. \quad \int_0^2 \frac{dx}{2x-4} = 1/2(\ln x - 2) = 0$$

$$2. \quad \sin \alpha = \frac{4}{5} \quad \pi < \alpha < 1.5 \pi$$

$$\cos \alpha = 3/5$$

$$\operatorname{tg} \alpha = \frac{\frac{4}{5}}{3/5} = \frac{4}{3}$$

$$3. \quad S(\text{to'la } s) = 8\sqrt{3} \quad a = \sqrt{3} \quad V = ?$$

$$S(\text{to'la } s) = 8\sqrt{3} = 3\sqrt{3}H \quad H = 8/3 \quad S(\text{asos}) = \frac{a^2\sqrt{3}}{4}$$

$$V = S(\text{asos})H = 8/3 * \frac{a^2\sqrt{3}}{4} = \frac{a^2\sqrt{3}}{6}$$

$$4. \quad S = 9 \quad 9 = 1/2 * 2R * R \quad R = 3$$

$$V = 4/3 * \pi R^3 = 4/3 * \pi * 27 = 36\pi$$

$$5. \quad 7x + 4y + 9 = 0 \quad 2x - y - 6 = 0$$

$$y = \frac{-9-7x}{4} \quad y = 2x-6$$

$$K = -7/4 \quad k = 2$$

$$\operatorname{tg} \alpha = \left| \frac{k_2 - k_1}{1 - k_2 * k_1} \right| = \left| \frac{2 + 7/4}{1 - 3.5} \right| = 1.5$$

29-bilet

$$1. \quad \frac{\int_{-2}^2 (9-x^2) dx}{3} = 18 - \frac{8}{3} - 18 + \frac{8}{3} = \frac{92}{3}$$

$$2. \quad \lg^2 x^2 + 5 \lg x > -1.25$$

$$4 \lg^2 x + 5 \lg x + 1.25 > 0$$

$$\operatorname{Lg} x = \frac{-5 \pm \sqrt{5}}{8} \quad x = 10^{\frac{-5 \pm \sqrt{5}}{8}}$$

$$3. \quad S(t) = 36t - 15t^2 \quad S' = 36 - 30t = 0 \quad t = 1.2$$

$$S = 36 * 1.2 - 15 * 1.2^2 = 21.6$$

Javob; $t = 1.2$; $s = 21.6$

$$4. \quad A(3; -5)$$

$$(x-3)^2 + (x+5)^2 = \sqrt{34}$$

$$5. \quad H = 5 \quad a = 6$$

$$R = \frac{a}{\sqrt{3}} = \frac{6}{\sqrt{3}} \quad V = \pi R^2 H = 36/3 * 3\pi = 36\pi$$

30-bilet

$$2. \quad \int_{-\pi/3}^{\pi/3} \sin^2 x dx = \int_{-\pi/3}^{\pi/3} \frac{1}{2} - \frac{\cos 2x}{2} = (x/2 - \sin 2x/4) = \left(\frac{\pi}{6} - \frac{\sqrt{3}}{8} \right) - \left(-\frac{\pi}{6} + \frac{\sqrt{3}}{8} \right) = \frac{\pi}{3} - \frac{\sqrt{3}}{4}$$

$$3. \quad 4^x + 2^{x+1} - 80 = 0$$

$$2^{2x} + 2 * 2^x - 80 = 0 \quad 2^x = a$$

$$a^2 + 2a - 80 = 0 \quad D = 324 \quad a_{1,2} = \left| \begin{matrix} 8 \\ -10 \end{matrix} \right|$$

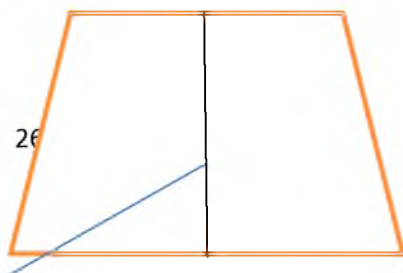
$$2^x = 8 \quad 2^x \neq -10$$

$$x = 3$$

$$4. \quad S(t) = 37t - 15t^2 \quad S' = 37 - 30t = 0 \quad t = \frac{37}{30}$$

$$S = 36 * \frac{37}{30} - 15 * \left(\frac{37}{30} \right)^2 = 21.58(3)$$

$$5. \quad L = 26 \quad r = 8$$



$$R^2 = \left(\frac{H}{2} \right)^2 + \left(\frac{a}{2} \right)^2 \quad R = \sqrt{576 + 324} =$$

$$= 30$$

$$V = \frac{4}{3} \pi R^3 = \frac{4}{3} \pi 27000 = 36000 \pi$$

18

18

$$6. \bar{a}(1,2,-1) \text{ va } \bar{b}(-3;4;2) \quad 2^* \bar{a} + 3 \bar{b} \text{ va } \bar{a} - 2 \bar{b} \quad \alpha = ?$$

$$2^* \bar{a} = (2;4;-2) \quad 3 \bar{b} = (-9;12;6)$$

$$\bar{a} - 2 \bar{b} = (1,2,-1) - (-6;8;4) = (7;-6;-5)$$

$$2^* \bar{a} + 3 \bar{b} = (-7;16;8)$$

$$\cos \alpha = \frac{\bar{a} \cdot \bar{b}}{|\bar{a}| \cdot |\bar{b}|} = \frac{-7 \cdot 7 + (-16 \cdot (-6)) + 8 \cdot (-5)}{\sqrt{49+36+25} \cdot \sqrt{49+256+64}} = \frac{7}{\sqrt{110} \cdot \sqrt{369}}$$

31-bilet

$$1. \int_{-\frac{\pi}{3}}^{\frac{\pi}{3}} \cos^2 x dx = \int_{-\frac{\pi}{3}}^{\frac{\pi}{3}} \frac{1}{2} + \frac{\cos 2x}{2} = (X/2 + \sin 2x/4) = (\frac{\pi}{6} - \frac{\sqrt{3}}{8}) - (-\frac{\pi}{6} + \frac{\sqrt{3}}{8}) = \frac{\pi}{3} - \frac{\sqrt{3}}{4}$$

$$2. 4^x - 2 \cdot 5^{2x} - 10^x > 0$$

$$\frac{4^x - 2 \cdot 5^{2x} - 10^x}{4^x} > 0$$

$$1 - 2 \cdot \left(\frac{5}{2}\right)^{2x} - \frac{5^x}{2} > 0 ;$$

$$\frac{5^x}{2} = a ; 1 - 2a^2 - a > 0 ; 2a^2 + a - 1 > 0 ;$$

$$2 \cdot (a + 1)(a - \frac{1}{2}) > 0$$

$$\frac{5^x}{2} > \frac{1}{2} \quad \longrightarrow \quad x > 0 ;$$

Javob: $x > 0$

$$3. V=27\text{m/h} ; s(t)=27t-14t^2$$

$$s'(t)=27-28t=0;$$

$$t=27/28;$$

$$s(27/28)=27 \cdot (27/28) - 14 \cdot (27/28)^2 = 1431/56$$

$$4. x+4y+9=0 \quad 3x-4y-6=0 \quad \alpha = ?$$

$$Y = -9/4 - x/4;$$

$$K_1 = -1/4$$

$$Y_2 = 3/4x - 3/2$$

$$K_2 = 3/4$$

$$\operatorname{tg} \alpha = \left| \frac{k_2 - k_1}{1 - k_2 \cdot k_1} \right| = \left| \frac{3/4 + 1/4}{1 - (3/4 \cdot 1/4)} \right| = 16/13$$

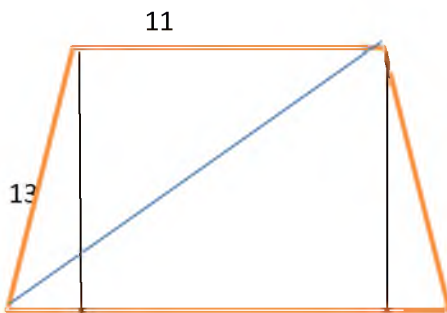
$$\alpha = \arctg(16/13)$$

$$\text{Javob: } \alpha = \arctg(16/13)$$

$$5. \ a = 11; \ b = 21; \ c = 3$$

$$s = 180 \text{ sm}^2$$

$$s = 180 \text{ sm}^2 = d \cdot H \quad h = 12 \quad d = 20 \quad H = 9 \text{ sm}$$



$$S_{\text{to'la}} = a \cdot h + b \cdot h + 2 \cdot c \cdot h = 12 \cdot 11 + 21 \cdot 12 + 2 \cdot 3 \cdot 12 = 456 \text{ sm}^2$$

32 Bilet

$$1 \quad \int_{-\pi/3}^{\pi/3} (1 - \sin x) dx = x + \cos x = \frac{\pi}{3} + \frac{1}{3} - \left(-\frac{\pi}{3} + \frac{1}{3} \right) = \frac{-2\pi}{3}$$

$$2 \quad \log_2 \log_3 \log_4 (x - 5) = 0$$

$$x - 5 = 64 \quad x = 69$$

$$3 \quad DB = 6 \quad AB = BC = 8 \quad AC = 12 \quad S = ?$$



$$DC = 10 \quad AC = 8\sqrt{2}$$

$$\frac{S}{S(\text{kesim})} = \frac{a^2}{b^2}$$

$$\frac{40}{x} = \frac{8\sqrt{2}}{5\sqrt{2}} \quad x = 25 \text{ sm}^2$$

$$4 \quad \frac{9}{x^2-9} + \frac{x^4+3x^3+9x^2}{(x+6)^2} * \left(\frac{1}{9-x^2} + \frac{9}{27-x^3} \right) = \frac{9}{x^2-9} + \frac{x^2(x^2+3x+9)}{(x+6)^2} * \left(\frac{1}{(3-x)(3+x)} + \frac{1}{(3-x)(9+3x+x^2)} \right)$$

$$= \frac{9}{x^2-9} + \frac{x^2(x^2+3x+9)}{(x+6)^2} * \frac{9+3x+x^2+18+9x}{(3-x)*(3+x)(9+3x+x^2)} = \frac{9}{x^2-9} + \frac{x^2}{(x+6)^2} * \frac{36+12x+x^2}{(3+x)(3-x)} = \frac{9}{x^2-9} + \frac{x^2}{(x+6)^2} * \frac{(x+6)^2}{9-x^2} = \frac{9}{x^2-9} - 1$$

5.

$$S = 25 \text{ sm}^2$$

$$25 = \frac{1}{2} 2R \cdot R \quad R = 5$$

$$V = \frac{4}{3} \pi R^3 = \frac{4}{3} \pi 5^3 = 500 \pi / 3 \quad \text{Javob; } V = 500 \pi / 3$$

33 Bilet

$$1 \quad \frac{\sin 2x}{\sin x} = 0$$

$$\sin x \neq 0 \quad x = \pi k \quad \sin 2x = 0 \quad x = \pi k / 2$$

$$2 \quad y = x^2 + 1 \quad y = x + 3 \quad S = ?$$

$$x^2 + 1 = x + 3 \quad x = -1 \quad x = 2 \quad \int_{-1}^2 (x + 3) dx = x^2/2 + 3x = 8 - 5/2 = 5.5$$

$$S = 5.5$$

$$3 \quad \frac{\log_3 125}{\log_{15} 3} \cdot \frac{\log_3 5}{\log_4 3} = 3 \log_3 5 * \log_3 15 - \log_3 5 \log_3 4 = \log_3 5 (3 * \log_3 15 - \log_3 4) = \log_3 5 \log_3 \frac{3375}{4}$$

$$4 \quad \alpha = 60^\circ \quad a = 0.6$$

$$\sin \alpha = \frac{x}{0.6} \quad x = 0.6 * \frac{\sqrt{3}}{2} = 0.3\sqrt{3}$$

$$5 \quad H = 20 \quad L = 25 \quad R = 15 \text{ bo'ladi}$$

$$\frac{R}{r} = \frac{L}{H} \quad r = \frac{RH}{L} = \frac{15 * 20}{25} = 12$$

34 Bilet

$$1 \quad y = \frac{4}{x} \quad x = 4 \quad x = 1$$

$$\int_1^4 \left(\frac{4}{x} \right) dx = 4 * \ln x = 8 = \ln x - (0) = 8 \ln x$$

$$2 \quad \sqrt{x^2 + 2x - 8} < 12 - x$$

$$x^2 + 2x - 8 < 144 - 24x + x^2 \quad 26x < 152$$

$$x < 152/26$$

$$3. v=31\text{m/h} \quad S(x)=31t-14t^2$$

$$S'(x)=31-28t=0 \quad t=31/28$$

$$S'(x)=30*31/28-14*(31/28)^2=149/56$$

$$4. S=16\pi sm^2 \quad 16\pi = 2\pi RH \quad H=2R$$

$$R=2 \quad V=4/3 * \pi R^3 = 4/3 * \pi 8 = 32 \pi /3$$

$$5 \quad \bar{a}(2,2,-4) \quad \text{va} \quad \bar{b}(-3;4;0) \quad 2 * \bar{a} + 3 \bar{b} \quad \text{va} \quad \bar{a} - 3 \bar{b} \quad \alpha = ?$$

$$2 * \bar{a}=(2;4;-8) \quad 3 \bar{b} =(-9;12;0)$$

$$\bar{a} - 3\bar{b} = (2,2,-4)-(-9;12;0)=(11;-10;-4) \quad 2 * \bar{a} + 3 \bar{b} =(-7;16;8)$$

$$\cos \alpha = \frac{\bar{a} \cdot \bar{b}}{|\bar{a}| \cdot |\bar{b}|} = \frac{-7 \cdot 11 + 16 \cdot (-10) + 8 \cdot (-4)}{\sqrt{49+256+64} + \sqrt{121+100+16}} = \frac{-125}{\sqrt{369} + \sqrt{237}}$$

$$\alpha = \arccos\left(\frac{-125}{\sqrt{369} + \sqrt{237}}\right)$$

35 Bilet

$$1 \quad y = x^3 + (50 - x)^3$$

$$y' = 3 * x^2 - 3(50 - x)^2 = 0 \quad x^2 - (50 - x)^2 = 0 \quad 100x - 2500 = 0 \quad x = 25$$

$$2 \quad y' = 6x^2 - 8x + 1$$

$$Y = 2 * x^3 - 4x^2 + x \quad y = 2 * x^3 - 4x^2 + x$$

$$Y = x(2 * x^2 - 4x + 1) = 0 \quad x = 0 \quad x = \frac{4 \pm \sqrt{8}}{4}$$

$$3 \quad v=32 \text{ km/h} \quad S(t)=32t-14t^2$$

$$S'(t)=32-28t=0 \quad t=8/7$$

$$S(8/7)=32*8/7-14*(8/7)^2=128/7$$

$$4 \quad a(-2;-5)$$

$$(x + 2)^2 + (y + 5)^2 = \sqrt{29}$$

$$5 \quad H=8 \quad a=14 \quad R=\frac{a}{\sqrt{3}}=\frac{14}{\sqrt{3}}$$

$$V = \pi R^2 H = \pi \frac{14}{3} 8 = \frac{112}{3} \pi$$

36 Bilet

$$1 \quad 3 \sin^2 x + \sin^2 2x = 1 \quad 1/\sin^2 x$$

$$3 + 4 \operatorname{cgt}^2 x = 1 + \operatorname{cgt}^2 x$$

$$3 \operatorname{cgt}^2 x - 2 = 0 \quad \operatorname{cgt}^2 x = \frac{1 + \cos 2x}{1 - \cos 2x} = \frac{2}{3} \quad 5 \cos 2x = -1$$

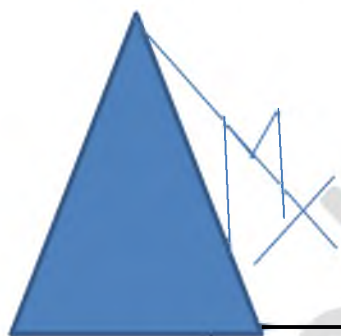
$$X = \arccos(-1/5)/2 + \pi k$$

$$2 \quad y = 2 - x^2 \quad y = -x$$

$$\int_2^{-1} (2 - x^2) dx = 2x - \frac{x^3}{3} = -2 + 1/3 - (4/3) = |3|$$

$$3 \quad \int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \cos^2 x dx = \int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \frac{1}{2} + \frac{\cos 2x}{2} dx = (x/2 + \sin 2x/4) = \frac{\pi}{8} - 1/4 + \frac{\pi}{8} - \frac{1}{4} = \frac{\pi}{4} - \frac{1}{2}$$

$$4 \quad H; M$$



$$M = 1/2 a \cdot h \quad h = 2M/a$$

$$\cos a = \frac{a \cdot a}{2 \cdot 2M} = \frac{a^2}{4M} \quad \operatorname{tga} = \frac{2 \cdot H}{a}$$

$$1 + \frac{4 \cdot H^2}{a^2} = \frac{16 \cdot M^2}{a^4} \quad \frac{a^4 + 4 \cdot (aH)^2 - 16 \cdot M^2}{a^4} = 0 \quad a^2 = t$$

$$T = \frac{-4 \pm \sqrt{(16H^2 - 64M^2)}}{2}$$

$$a = \sqrt{\frac{-4 \pm \sqrt{(16H^2 - 64M^2)}}{2}} \quad S = a^2 = \frac{-4 \pm \sqrt{(16H^2 - 64M^2)}}{2}$$

$$5 \quad S = 16 \quad V = ? \quad 16 = 1/2 \cdot 2R \cdot R \quad R = 4$$

$$V = 4/3 \pi R^3 = 256/3 \pi$$

37 BILET

$$1 \quad F(x) = x^2 + 2x + 3 \quad X_0 = 1$$

$$Y = f(x) + f'(x)(x - X_0) \quad f'(x) = 2x + 2$$

$$Y = 6 + 4(1 - x) = 10 - 4x$$

$$2 \quad \lg 3 = a \quad \lg 2 = b \quad \log_5 6 = \frac{\lg 6}{\lg 5} = \frac{a+b}{1-b}$$

$$3 \quad S(t) = 34t - 14t^2 \quad v = 34 \text{ m/h}$$

$$S'(t) = 34 - 28t = 0 \quad t = 17/14$$

$$S(t)=34*17/14-14*(17/14)^2=289/14m$$

$$4 \quad S=Q \quad Q=4*R^2 \quad R^2=Q/4$$

$$S_{\text{os}} = \pi R^2 = \pi Q/4$$

$$5 \quad a=m \quad V=?$$

$$V = \frac{a^2 * \sqrt{2}}{12} = \frac{m^2 * \sqrt{2}}{12}$$

38 Bilet

$$1 \quad \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \sin 2x \sin 4x = \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} 2 * \sin^2 2x \cos 2x = 2 \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} (1 - \cos^2 2x) \cos 2x = \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} (\cos 2x - \cos^3 2x) = \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \cos 2x - \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \cos^3 2x =$$

$$= \left(\frac{\sin 2x}{2} - \frac{3}{8} * \frac{\sin 2x}{4} + \frac{1}{4} \frac{\cos 6x}{1} \right) = 1/8 - (1/2 - 3/32) = -9/32$$

$$2. \quad \begin{cases} \log_3(x - y) = 1 \\ 10 * 28^{-y} - 5^{x-1} = 125 \end{cases}$$

Berilgan ma'lumotlarda kamchilik mavjud!!!!

$$3 \quad v=35 \text{ km/h} \quad S(t)=35t-14t^2$$

$$S'(t)=35-28t=0 \quad t=5/4$$

$$S(5/4)=35*5/4-14*(5/4)^2=18.125$$

4.

$$\tan \alpha = \frac{H}{R-r} \quad H = \tan \alpha * (R-r)$$

$$V = \frac{H}{3} \pi (R^2 + r * R + r^2) = \frac{\tan \alpha * (R-r)}{3} * (R^2 + r * R + r^2)$$

$$5. \quad |\vec{a}|=4 \quad |\vec{b}|=7 \quad \alpha = 60^\circ$$

$$|2\vec{a}-3\vec{b}|=?$$

$$\vec{a}\vec{b}=. \quad |\vec{a}|*|\vec{b}|\cos \alpha = 4*7*1/2=14$$

$$|2a-3b|=4*a*a-12ab+9b*b=4*4-4*12+9*7=31$$

39-bilet

$$1. \quad 2\cos^2 2x + 3\cos^2 2x = 2$$

$$5\cos^2 2x = 2$$

$$\cos^2 2x = 2/5 \quad \frac{1+\cos 4x}{2} = 2/5 \quad \cos 4x = -1/5$$

$$x = \pm \arccos(-1/5) * 1/4 + 2\pi k$$

$$2. \quad f(x) = 1 + 2x^2 - x^4$$

$$f'(x) = 4x - 4x^3 = 0 \quad x=0 \quad x=1 \quad x=-1$$

$$3 \quad v=36 \text{ km/h} \quad S(t)=36t-14t^2$$

$$S'(t)=36-28t=0 \quad t=9/7$$

$$S(9/7)=36*9/7-14*(9/7)^2=162/7$$

$$4. N=4 \quad k=10 \text{ ta}$$

$$T = \frac{10!}{(10-4)!*4!} = 210$$

$$5. L=5 \quad H=3 \quad V(\text{ichki.ch.shar})=?$$

$$\frac{L}{H-r} = \frac{R}{r} \quad \frac{5}{3-r} = \frac{4}{r} \quad r=4/3$$

$$V = 4/3 * \pi r^3 = 4/3 * \pi (4/3)^3 = 64 * \pi / 27$$

40-bilet

$$1. \quad Y=x \quad y=x^2-2$$

$$X=x^2-2$$

$$X=2 \quad x=-1$$

$$\int_{-1}^2 (x - x^2 + 2) dx = \frac{x^2}{2} - \frac{x^3}{3} + 2x = (2-8/3+4) - (1/2+1/3-2) = 4.5$$

$$2. \quad \sqrt{3}\sin x + \cos x = 2 \quad / 2 \quad \text{bo'lamiz}$$

$$\sqrt{3}\sin x/2 + \cos x/2 = 1 \quad \cos(60-x)=1 \quad 60-x=2\pi k, \quad x=60-2\pi k$$

$$3 \quad v=37 \text{ km/h} \quad S(t)=37t-14t^2$$

$$S'(t)=37-28t=0 \quad t=37/28$$

$$S(37/28)=37*37/28-14*(37/28)^2=1369/56$$

4-misol

$$S=512 \quad H=16 \quad S_1=50$$
$$\frac{S}{S_1} = \frac{H}{H-x} \quad \frac{512}{50} = \frac{16}{16-x} \quad x=231/25$$

5.

$$L=39 \quad R=12$$

Berilgan masalada kesik konusga tashqi chizilgan konus konusning Aynan o'ziga teng bo'ladi.

5-masalda xatolik mavjud.

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