

2406677 | 1) $49^9 \cdot 3^{12} : 147^9 = \left(\frac{49}{147}\right)^9 \cdot 3^{12} = \left(\frac{1}{3}\right)^9 \cdot 3^{12} =$
 $= 3^{-9} \cdot 3^{12} = 3^{12-9} = 3^3 = 27$

2) $\sqrt{2x+9} = x-3 \Rightarrow 2x+9 = (x-3)^2 \Rightarrow$
 $\Rightarrow 2x+9 = x^2-6x+9 \Rightarrow x^2-8x=0 \Rightarrow x(x-8)=0 \Rightarrow$
 $\Rightarrow x_1=0 \quad x_2=8$

3) $\cos 2x = -\frac{1}{2} \Rightarrow 2x = \pi - \arccos \frac{1}{2} \Rightarrow 2x = \pi \pm \frac{\pi}{3} + 2\pi k$
 $x = \frac{\pi}{2} \pm \frac{\pi}{6} + \pi k \quad k \in \mathbb{Z}$

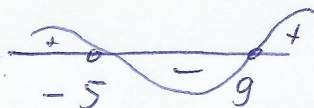
4) $\log_{0,5}(x-2) > \log_{0,5} 4$ ОДЗ: $x-2 > 0 \quad x > 2$

$-\log_2(x-2) > -\log_2 4 \Rightarrow \log_2(x-2) \leq 2 \Rightarrow x-2 \leq 4 \Rightarrow$
 $x \leq 6$ с учетом ОДЗ $2 < x \leq 6$

$x = 3; 4; 5; 6$

5) $y = \sqrt{-x^2+4x+45}$ $-x^2+4x+45 \geq 0 \Rightarrow$

$\Rightarrow x^2-4x-45 \leq 0 \Rightarrow (x-9)(x+5) \leq 0$



$-5 \leq x \leq 9$

6) $y = x^3 - 3x^2 + 4$ $y' = 3x^2 - 6x$ $3x^2 - 6x = 0$

$3x(x-2) = 0 \quad x_1 = 0 \quad x_2 = 2$

$y'' = 6x - 6 \quad y''(0) = -6 < 0 \quad y(0) = 4 - \text{max}$

$y''(2) = 6 > 0 \quad y(2) = 0 - \text{min}$

7) $y = x^2 - 7x + 10 \quad y' = 2x - 7 \quad \text{tg } \alpha = y'(1) = -5$

8) Радиус вписанной окружности в треугольник.

$r = (p-c) \text{tg } \frac{\delta}{2}$

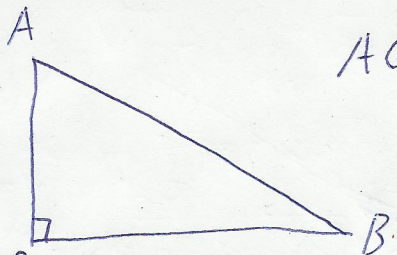
поскольку треугольник - равносторонний, то

$p = \frac{3a}{2}; \delta = 60^\circ; p-c = \frac{3a}{2} - a = \frac{a}{2}; \text{tg } \frac{\delta}{2} = \text{tg } 30^\circ = \frac{1}{\sqrt{3}}$

и $r = \frac{a}{2\sqrt{3}} \Rightarrow \frac{a}{2\sqrt{3}} = \sqrt{3}$, откуда сторона основания призма

$a = 2\sqrt{3} \cdot \sqrt{3} = 2 \cdot 3 = 6$ и $S_{\text{бок}} = 3 \cdot a \cdot h = 3 \cdot 6 \cdot 3 = 54$

9)



$$AC = 8 \quad \cos A = 0,8$$

BC - ?

$$BC = AC \cdot \operatorname{tg} A; \quad \operatorname{tg} A = \frac{\sin A}{\cos A} =$$

$$= \frac{\sqrt{1 - \cos^2 A}}{\cos A}; \quad \operatorname{tg} A = \frac{\sqrt{1 - 0,64}}{0,8} = \frac{0,6}{0,8} = \frac{3}{4}$$

$$BC = 8 \cdot \frac{3}{4} = 6$$

10) $s = t^4 - 2t^2$

$$v = \frac{ds}{dt} = 4t^3 - 4t \quad v(t=3) = 4 \cdot 27 - 12 = 96 \frac{\text{m}}{\text{с}}$$