2408776

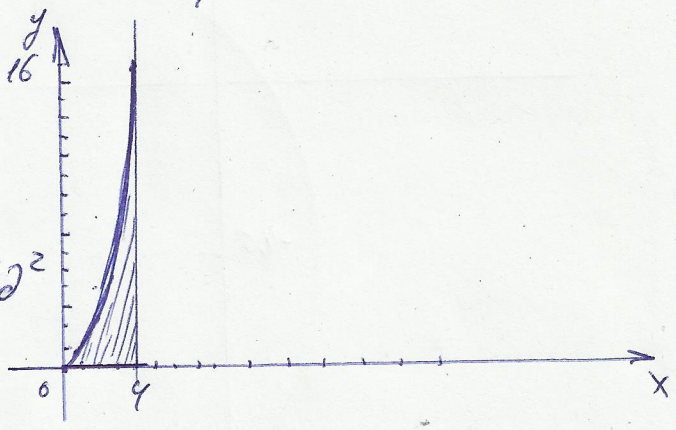
1) $\int(3x^3-6x^2+4x-14)dx = \int 3x^3dx - \int 6x^2dx + \int 4xdx - \int 14dx =$

$= 3\int x^3dx - 6\int x^2dx + 4\int xdx - 14\int dx = \frac{3}{4}x^4 - 2x^3 + 2x^2 - 14x + C$

2) $\int_{-1}^{0}(12x^2-4x+9)dx = 12\int_{-1}^{0}x^2dx - 4\int_{-1}^{0}xdx + 9\int_{-1}^{0}dx = 4x^3 - 2x^2 + 9x\Big|_{-1}^{0} =$

$= 4 + 2 + 9 = 15$

3) $y = x^2$; $y = 0$; $x = 0$; $x = 4$



$S = \int_0^4 x^2dx = \frac{x^3}{3}\Big|_0^4 = \frac{4^3}{3} = \frac{64}{3}$ ед^2

4) $\frac{1-\cos^2t}{1-\sin^2t} = \frac{\sin^2t}{\cos^2t} = tg^2t$

5) $\arccos\left(-\frac{\sqrt{3}}{2}\right) + \arcsin\left(-\frac{\sqrt{3}}{2}\right) = \pi - \arccos\frac{\sqrt{3}}{2} - \arcsin\frac{\sqrt{3}}{2} =$

$= \pi - \frac{\pi}{6} - \frac{\pi}{3} = \frac{6\pi-\pi-2\pi}{6} = \frac{3\pi}{6} = \frac{\pi}{2}$

6) $\sin^2x - 2\sin x\cos x = 3\cos^2x \Rightarrow \frac{\sin^2x}{\sin^2x} - \frac{2\sin x\cos x}{\sin^2x} = \frac{3\cos^2x}{\sin^2x} \Rightarrow$

$\Rightarrow 1 - 2\frac{\cos x}{\sin x} = 3\frac{\cos^2x}{\sin^2x} \Rightarrow 1 - 2ctg\,x = 3ctg^2x \Rightarrow$

$\Rightarrow 3ctg^2x + 2ctg\,x - 1 = 0 \Rightarrow ctg\,x_{1,2} = \frac{-2\pm\sqrt{4+12}}{6} = \frac{-2\pm4}{6}$

$ctg\,x_1 = -1$; $ctg\,x_2 = \frac{1}{3}$

$x_1 = arcctg(-1) + \pi k$; $x_2 = arcctg\frac{1}{3} + \pi k$ $k \in Z$

$x_1 = \pi - arcctg\,1 + \pi k$; $x_1 = \pi - \frac{\pi}{4} + \pi k = \frac{3\pi}{4} + \pi k$ $k \in Z$

7) $a = 3i + 5j + k$ $b = 7i - 2j - k$

$(\bar{a}, \bar{b}) = xx' + yy' + zz' = 3\cdot7 - 5\cdot2 - 1\cdot1 = 21 - 10 - 1 = 10$

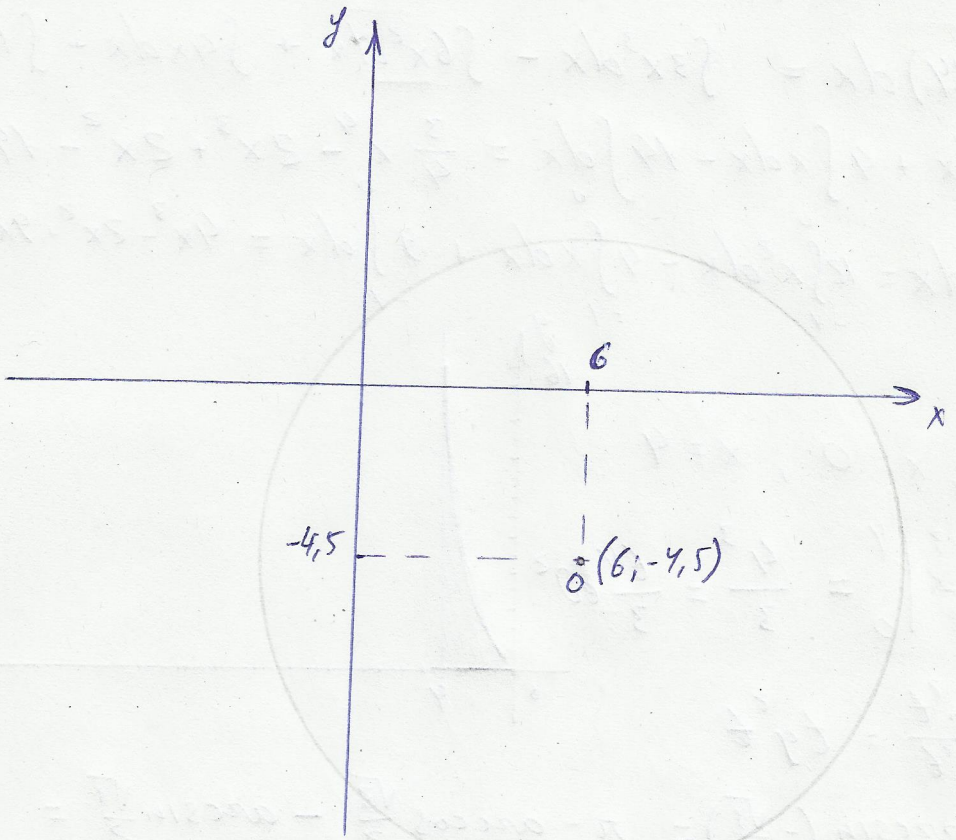
8) $A = (5; -2)$; $B = (12; 10)$ $\frac{y-y_1}{y_2-y_1} = \frac{x-x_1}{x_2-x_1} \Rightarrow \frac{y+2}{10+2} = \frac{x-5}{12-5} \Rightarrow$

$\Rightarrow y + 2 = \frac{(x-5)}{7}\cdot12 \Rightarrow y = \frac{12}{7}x - \frac{60}{7} - 2 \Rightarrow y = \frac{12}{7}x - \frac{74}{7}$

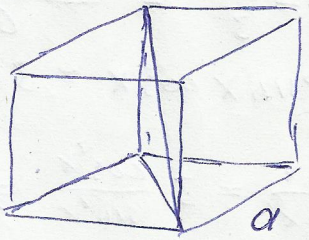
9) $x^2 + y^2 - 12x + 9y - 16 = 0$; уравнение окружности $x^2 + y^2 + 2Ax + 2By + C = 0$

координаты центра $(-A, -B) = (6; -4{,}5)$

радиус $r = \sqrt{A^2+B^2-C} = \sqrt{6^2+4{,}5^2+16} = \frac{17}{2} = 8{,}5$



10) Диагональ куба $\sqrt{48}$ $V_{куба}$ - ?



Диагональ основания

$$d^2 = 2a^2$$

Диагональ куба

$$D^2 = a^2 + d^2 = 3a^2, \text{ откуда } a = \sqrt{\frac{D^2}{3}}$$

Объем куба

$$V = a^3 = \sqrt{\left(\frac{D^2}{3}\right)^3} = \sqrt{\left(\frac{48}{3}\right)^3} = \sqrt{16^3} = 4^3 = 64 \text{ ед}^3$$

11) В условии не написано, что найти.