
1.1 $\bar{x} = [2, 8, 1]$

$\bar{y} = [3, 12, -1]$

$СП: (\bar{x}, \bar{y}) = 2 \cdot 3 + 8 \cdot 12 + 1 \cdot (-1) = 101$

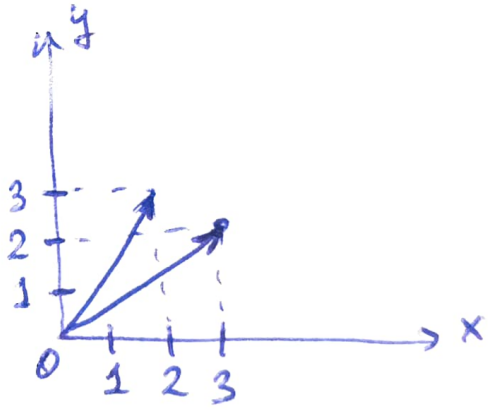
$$\text{Угол: } \cos(\hat{\bar{x}\bar{y}}) = \frac{(\bar{x}, \bar{y})}{|\bar{x}| \cdot |\bar{y}|} = \frac{101}{\sqrt{2^2+8^2+1^2} \cdot \sqrt{3^2+12^2+(-1)^2}} =$$

$$= \frac{101}{8{,}306 \cdot 12{,}41} \approx \frac{101}{103} = 0{,}98$$

$$\hat{\bar{x}, \bar{y}} = \arccos(0{,}98) \approx 11^\circ$$

1.2 $\bar{t} = [2, 3]$

$\bar{z} = [3, 2]$



$\bar{i} = [1, 1]$

$\bar{j} = [1, 1]$

$(\bar{i}, \bar{t}) = 2 \cdot 1 + 3 \cdot 1 = 5 \Rightarrow (\bar{i}, \bar{t}) = (\bar{j}, \bar{z})$

$(\bar{j}, \bar{z}) = 3 \cdot 1 + 2 \cdot 1 = 5$

2.1 1) $f(x) = x^2 + 2x$

$f'(x_0) = 2x_0 + 2 = 0$ - экстремум ф-ии

$x_0 = -1$ - точка экстремума.

$f''(x_0) = 2 \Big|_{x_0 = -1} > 0$

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

$f'(x_0) = 2\cos x_0 = 0 \Rightarrow x_0 = \frac{\pi}{2} + \pi n, \; n \in \mathbb{Z}$

3) $f(x) = \log_2 x + 3$

$f'(x_0) = \frac{1}{x_0 \ln 2} \neq 0$ - нет решения

$f(x) \geq 3$ и при $x_0 = 1 \; f(x_0) = 3$

$\Rightarrow$ Минимум в точке $x_0 = 1$

③ $\begin{pmatrix} 1 & -3 & 2 \\ 3 & -4 & 1 \\ 2 & -5 & 3 \end{pmatrix} \cdot \begin{pmatrix} 2 & 5 & 6 \\ 1 & 2 & 5 \\ 1 & 3 & 2 \end{pmatrix} =$

$= \begin{pmatrix} 2-3+2 & 5-6+6 & 6-15+4 \\ 6-4+1 & 15-8+3 & 18-20+2 \\ 4-5+3 & 10-10+9 & 12-25+6 \end{pmatrix} = \begin{pmatrix} 1 & 5 & -5 \\ 3 & 10 & 0 \\ 2 & 9 & -7 \end{pmatrix}$

$\overline{x} = [6, 8]$

$|\overline{x}| = \sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10$