Практикум 7

(2.1)

$$\vec{a} = (1; -1; 0)$$
$$\vec{b} = (2; 4; -1)$$
$$\vec{c} = (3; 2; 1)$$

$$2\vec{a} - \vec{b} - 2\vec{c} = 2(1; -1; 0) - (2; 4; -1) -$$
$$-2(3; 2; 1) = (2 - 2 - 6; -2 - 4 - 4; 0 + (-2)) =$$
$$= (-6; -10; -1) // \text{ответ}$$

④

$$\vec{a} = 6\vec{i} - 2\vec{j} + \vec{k}$$
$$\vec{b} = \vec{c} + 5\vec{j} + 2\vec{k}$$
$$\vec{c} = \vec{c} + 5\vec{j} - 2\vec{k}$$

$$\vec{a} \perp \vec{b}, \quad \lambda = ?$$

$\cos(\vec{a}, \vec{b}) = 0$ — достаточно

$(\vec{a}, \vec{b}) = 0$

$$(\vec{a}, \vec{b}) = (6; -\lambda; 1) \cdot (1; 5; -2) =$$
$$= 6 - 6\lambda = 0 \Rightarrow \lambda = 1 // \text{Ответ}$$

⑥ $\bar{a}, \bar{b}, \bar{c}$ - некомпл.

$$\left.\begin{array}{l} \bar{p} = \lambda\bar{a} + \bar{b} + \bar{c} \\ \bar{q} = \bar{a} + 2\bar{b} + \bar{c} \\ \bar{r} = \bar{a} + \bar{b} + \lambda\bar{c} \end{array}\right\} \text{компл., } \lambda = ?$$

$$[\bar{p} \times \bar{q}] \cdot \bar{r} = 0$$

Разложим $\bar{p}, \bar{q}, \bar{r}$ по базису $\bar{a}, \bar{b}, \bar{c}$:

$$\bar{p} = (p_a; p_b; p_c) = (\lambda; 1; 1)$$
$$\bar{q} = (q_a; q_b; q_c) = (1; 2; 1)$$
$$\bar{r} = (r_a; r_b; r_c) = (1; 1; \lambda)$$

Тогда:

$$[\bar{p} \times \bar{q}] \cdot \bar{r} = \begin{vmatrix} \lambda & 1 & 1 \\ 1 & 2 & 1 \\ 1 & 1 & \lambda \end{vmatrix} =$$

$$= (\lambda - 1)^2 (\lambda + 2) = 0$$

$$\lambda_1 = 1; \quad \lambda_2 = -2 \quad // \text{Ответ}$$