Практикум 6

(3.6)

$A=(-2;-3;1)$
$B=(-1;-1;0)$
$C=(4;1;1)$
$D=(-5;5;3)$

$AC \perp BD$?

$\overrightarrow{AC}=(6;4;0)$
$\overrightarrow{BD}=(-4;6;3)$

$(\overrightarrow{AC}\cdot\overrightarrow{BD})=-4\cdot6+6\cdot4+0\cdot3=$
$=0 \Rightarrow AC \perp BD$ //Ответ.

(6) $|\bar{a}|=4$
$|\bar{b}|=5$
$(\bar{a};\bar{b})=\frac{\pi}{4}$
$\bar{I}=\bar{a}-2\bar{b}$
$\bar{II}=3\bar{a}+2\bar{b}$
$S_\Delta=?$

$S_\Delta=\frac{I\cdot II\cdot\sin(\hat{I};\hat{II})}{2}$

$S_\Delta=\frac{|[\bar{a}-2\bar{b}\times 3\bar{a}+2\bar{b}]|}{2}=$

$=\frac{1}{2}\left|[\bar{a}\times 3\bar{a}]-[2\bar{b}\times 3\bar{a}]+\right.$
$\left.+[\bar{a}\times 2\bar{b}]-[2\bar{b}\times 2\bar{b}]\right|=$
$=\frac{1}{2}|6[\bar{b}\times\bar{a}]+2[\bar{a}\times\bar{b}]|=$
$=4\cdot|\bar{a}|\cdot|\bar{b}|\cdot\sin\frac{\pi}{4}=$
$=4\cdot4\cdot5\cdot\frac{\sqrt{2}}{2}=40\sqrt{2}$
//Ответ

(4.1) $\bar{a} = \bar{i} + 2\bar{j} - \bar{k} = (1; 2; -1)$

$\bar{b} = 9\bar{i} - 11\bar{j} + 3\bar{k} = (9; -11; 3)$

$\bar{c} = 2\bar{i} + 4\bar{j} - 2\bar{k} = (2; 4; -2)$

Если $\bar{a}, \bar{b}, \bar{c}$ комп., то

$\bar{d} = [\bar{a} \times \bar{b}] \perp \bar{c}$, т.е. $(\bar{d}, \bar{c}) = 0$

- $\bar{d} = \begin{vmatrix} \bar{i} & \bar{j} & \bar{k} \\ 1 & 2 & -1 \\ 9 & -11 & 3 \end{vmatrix} = 6\bar{i} - 9\bar{j} - 11\bar{k} - 18\bar{k} - 11\bar{i} - 3\bar{j} =$

$= -5\bar{i} - 12\bar{j} - 29\bar{k} = (-5; -12; -29)$

- $(\bar{d}, \bar{c}) = d_x c_x + d_y c_y + d_z c_z =$

$= -5 \cdot 2 - 12 \cdot 4 + 29 \cdot 2 = -10 - 48 + 58 = 0 \Rightarrow$

$\Rightarrow \bar{a}, \bar{b}, \bar{c}$ - компланарны // Ответ