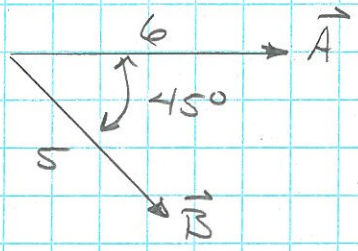
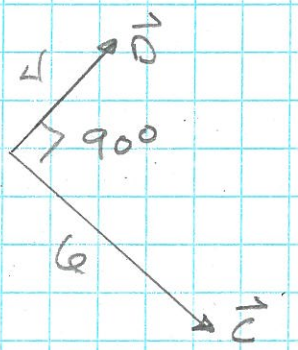
a.)



$|\vec{A} \times \vec{B}| = AB \sin 45° = 21.21$

RHR ⇒ direction is into the page.

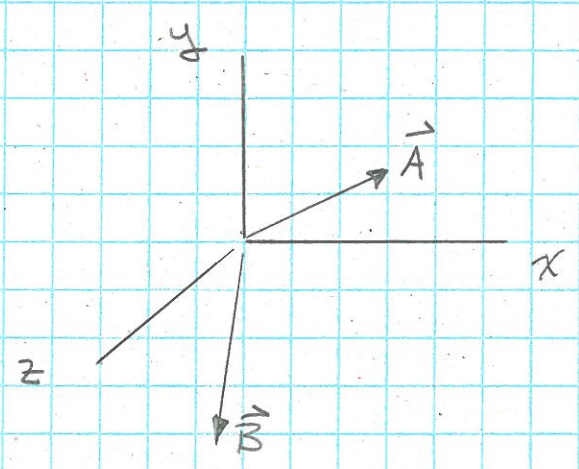
b.)



$|\vec{C} \times \vec{D}| = CD \sin 90° = 24.0$

RHR ⇒ direction is out of page.

c.) $\vec{A} = 3\hat{i} + \hat{j}$ $\quad \vec{B} = 3\hat{i} - 2\hat{j} + 2\hat{k}$



$$\vec{A} \times \vec{B} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 3 & 1 & 0 \\ 3 & -2 & 2 \end{vmatrix}$$

$$= \hat{i}\begin{vmatrix} 1 & 0 \\ -2 & 2 \end{vmatrix} - \hat{j}\begin{vmatrix} 3 & 0 \\ 3 & 2 \end{vmatrix} + \hat{k}\begin{vmatrix} 3 & 1 \\ 3 & -2 \end{vmatrix}$$

$$= \hat{i}(2-0) - \hat{j}(3\cdot 2 - 0) + \hat{k}(3\cdot(-2) - 3\cdot 1)$$

$$\vec{A} \times \vec{B} = 2\hat{i} - 6\hat{j} - 9\hat{k}$$