

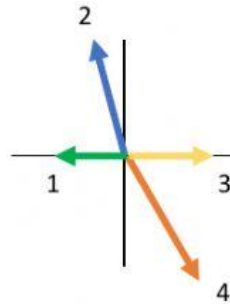
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Vector Multiplication

Given the following vectors: (a) identify their correct diagrams, and (b) write them in unit-vector notation form.

$$\begin{aligned}\vec{A} &= 80 \text{ m}, 20^\circ \text{ N of W} \\ \vec{B} &= 65 \text{ m}, \text{ E} \\ \vec{C} &= 90 \text{ m}, 60^\circ \text{ S of E} \\ \vec{D} &= 55 \text{ m}, \text{ W}\end{aligned}$$



Vector	Diagram	Unit Vector Notation
$\vec{A}$		
$\vec{B}$		
$\vec{C}$		
$\vec{D}$		

Using the vectors above, find the following:

$\mathbf{A \cdot B}$	$\begin{aligned}A \cdot B &= AB \cos \theta \\ &= (\quad)(\quad) \cos \text{---}^\circ \\ &= \text{---} \text{ m}^2\end{aligned}$
	$\begin{aligned}A \cdot B &= A_x B_x + A_y B_y + A_z B_z \\ &= (\quad)(\quad) + (\quad)(\quad) + (\quad)(\quad) \\ &= \text{---} + \text{---} + \text{---} \\ &= \text{---} \text{ m}^2\end{aligned}$
$\mathbf{B \times A}$	$\begin{aligned}B \times A &= BA \sin \theta \\ &= (\quad)(\quad) \sin \text{---}^\circ \\ &= \text{---} \text{ m}^2, \text{ along the ---axis}\end{aligned}$
	$\begin{aligned}B \times A &= i \begin{vmatrix} B_y & B_z \\ A_y & A_z \end{vmatrix} - j \begin{vmatrix} B_x & B_z \\ A_x & A_z \end{vmatrix} + k \begin{vmatrix} B_x & B_y \\ A_x & A_y \end{vmatrix} \\ &= i \begin{vmatrix} \quad & \quad \\ \quad & \quad \end{vmatrix} - j \begin{vmatrix} \quad & \quad \\ \quad & \quad \end{vmatrix} + k \begin{vmatrix} \quad & \quad \\ \quad & \quad \end{vmatrix} \\ &= i \{ (\quad)(\quad) - (\quad)(\quad) \} - j \{ (\quad)(\quad) - (\quad)(\quad) \} + \\ &\quad k \{ (\quad)(\quad) - (\quad)(\quad) \} \\ &= \text{---}i \quad \text{---}j \quad \text{---}k\end{aligned}$

D•C	$D \cdot C = DC \cos \theta$ $= (\quad)(\quad) \cos \text{---}^\circ$ $= \text{---} \text{ m}^2$
	$D \cdot C = D_x C_x + D_y C_y + D_z C_z$ $= (\quad)(\quad) + (\quad)(\quad) + (\quad)(\quad)$ $= \text{---} + \text{---} + \text{---}$ $= \text{---} \text{ m}^2$
CxD	$C \cdot D = CD \sin \theta$ $= (\quad)(\quad) \sin \text{---}^\circ$ $= \text{---} \text{ m}^2, \text{ along the ---axis}$
	$C \times D = i \begin{vmatrix} C_y & C_z \\ D_y & D_z \end{vmatrix} - j \begin{vmatrix} C_x & C_z \\ D_x & D_z \end{vmatrix} + k \begin{vmatrix} C_x & C_y \\ D_x & D_y \end{vmatrix}$ $= i \begin{vmatrix} \quad & \quad \\ \quad & \quad \end{vmatrix} - j \begin{vmatrix} \quad & \quad \\ \quad & \quad \end{vmatrix} + k \begin{vmatrix} \quad & \quad \\ \quad & \quad \end{vmatrix}$ $= i \{ (\quad)(\quad) - (\quad)(\quad) \} - j \{ (\quad)(\quad) - (\quad)(\quad) \} +$ $k \{ (\quad)(\quad) - (\quad)(\quad) \}$ $= \text{---} i \square \text{---} j \square \text{---} k$