

Answer on Question #39603, Physics, Mechanics | Kinematics | Dynamics

Question:

what is the cross product $\vec{A} \times \vec{B}$ under mirror reflection

Answer:

If a point of an object has coordinates (x, y, z) then the image of this point (as reflected by a mirror in the y, z plane) has coordinates $(-x, y, z)$.

Suppose $\vec{A} \times \vec{B} = \vec{C}$

Therefore, cross product transforms:

$$\vec{A}' \times \vec{B}' = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ -A_x & A_y & A_z \\ -B_x & B_y & B_z \end{vmatrix} = \vec{i}C_x - \vec{j}C_y - \vec{k}C_z = \begin{pmatrix} C_x \\ -C_y \\ -C_z \end{pmatrix}$$

$$\text{Answer: } \vec{A}' \times \vec{B}' = \begin{pmatrix} (\vec{A} \times \vec{B})_x \\ -(\vec{A} \times \vec{B})_y \\ -(\vec{A} \times \vec{B})_z \end{pmatrix}$$