

Answer on Question #66422-Physics-Other

Find the magnitude of the area of a triangle whose two sides are represented by $A=6i-2j+3k$ and $B=i+2j-2k$

Solution

$$\mathbf{A} \times \mathbf{B} = \begin{vmatrix} \mathbf{i} & \mathbf{j} & \mathbf{k} \\ 6 & -2 & 3 \\ 1 & 2 & -2 \end{vmatrix} = -2\mathbf{i} + 15\mathbf{j} + 14\mathbf{k}$$

$$|\mathbf{A} \times \mathbf{B}| = \sqrt{(-2)^2 + (15)^2 + (14)^2} = 5\sqrt{17}$$

The area of a triangle is

$$A = \frac{1}{2} |\mathbf{A} \times \mathbf{B}| = \frac{5\sqrt{17}}{2}.$$

Answer: $\frac{5\sqrt{17}}{2}$.

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