

Uses of the Dot Product

1. Find the angle between the vectors $\mathbf{A} = \mathbf{i} + 8\mathbf{j}$ and $\mathbf{B} = \mathbf{i} + 2\mathbf{j}$.
2. Take points $P = (a, 1, -1)$, $Q = (0, 1, 1)$, $R = (a, -1, 3)$. For what value(s) of a is PQR a right angle?
3. Show that the diagonals of a parallelogram are perpendicular if and only if it is a rhombus, i.e., its four sides have equal lengths.

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