

Vector Cross product

IB HL

1. Given that $a = i + 2j - 3k$, $b = 4i - 2j - 5k$, and $c = 3j - k$, find $(a \times b) \cdot c$.

2. a has a position vector $2i + 3j - k$ and b has a position vector $i - 3j + 5k$.

Find the vector that is normal to a and b .

3. The triangle PQR has vertices $P(4, 1, 2)$, $Q(3, 1, 2)$, and $R(5, -1, -3)$.

Find the area of the triangle PQR .

4. The parallelogram $ABCD$ has vertices $A(1, 2, 3)$, $B(4, 1, 5)$, $C(5, 2, 6)$, and $D(2, 3, 4)$.

Find the area of the parallelogram $ABCD$.

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Answers

1. -11

2. $12i - 11j - 9k$

3. $\frac{\sqrt{29}}{2}$

4. $\sqrt{26}$