

Answer on Question #56112– Math – Vector Calculus

Given that $A = 2i - 3j + 5k$, $B = 3i + j - 2k$

Find $|(A + B) \cdot (A - B)|$

Solution

$$A + B = 2i - 3j + 5k + 3i + j - 2k = 5i - 2j + 3k$$

$$A - B = 2i - 3j + 5k - 3i - j + 2k = -i - 4j + 7k$$

The Dot product formula:

$$a \cdot b = a_x b_x + a_y b_y + a_z b_z$$

Then

$$(A + B) \cdot (A - B) = 5 \cdot (-1) - 2 \cdot (-4) + 3 \cdot 7 = 24$$

$$|(A + B) \cdot (A - B)| = (A + B) \cdot (A - B) = 24$$

Answer:

$$|(A + B) \cdot (A - B)| = 24$$