Answer on question #61851, Physics / Other

Question   Given that vectors a=5i2j+3k b=3i+j2k and c=i3j+4k, calculate
the scalar triple product $a \cdot (b \times c)$
a. 12
b. 6
c. -12
d -6.

Solution

$$\mathbf{a} \cdot (\mathbf{b} \times \mathbf{c}) \equiv \det \begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix} =$$

$$= \det \begin{bmatrix} 5 & -2 & 3 \\ 3 & 1 & -2 \\ 1 & -3 & 4 \end{bmatrix} = 20 + 4 - 27 - 3 + 24 - 30 = -12$$