

43. We apply Eq. 3-30 and Eq.3-23. If a vector capable calculator is used, this makes a good exercise for getting familiar with those features. Here we briefly sketch the method.

(a) We note that $\vec{b} \times \vec{c} = -8\hat{i} + 5\hat{j} + 6\hat{k}$. Thus, $\vec{a} \cdot (\vec{b} \times \vec{c}) = (3)(-8) + (3)(5) + (-2)(6) = -21$.

(b) We note that $\vec{b} + \vec{c} = 1\hat{i} - 2\hat{j} + 3\hat{k}$. Thus, $\vec{a} \cdot (\vec{b} + \vec{c}) = (3)(1) + (3)(-2) + (-2)(3) = -9$.

(c) Finally, $\vec{a} \times (\vec{b} + \vec{c}) = ((3)(3) - (-2)(-2))\hat{i} + ((-2)(1) - (3)(3))\hat{j} + ((3)(-2) - (3)(1))\hat{k} = 5\hat{i} - 11\hat{j} - 9\hat{k}$.