

Consider 4 vectors:

$$\vec{a} = (1, 2, 0) , \vec{b} = (1, -1, 0) , \vec{c} = (0, 0, 2) , d = (1, 0, 0)$$

Find

1.

$$\vec{a} \cdot \vec{b}$$

2.

$$\vec{c} \times \vec{d}$$

3.

$$\vec{c} \cdot (\vec{a} \times \vec{b})$$

4.

$$\vec{a} \times (\vec{b} \times \vec{c})$$

5.

$$\vec{b}(\vec{a} \cdot \vec{c}) - \vec{c}(\vec{a} \cdot \vec{b})$$

(the "BAC-CAB" relation)

6.

$$(\vec{a} + \vec{b}) \cdot (\vec{a} - \vec{b})$$

7.

$$(\vec{c} + \vec{d}) \times (\vec{c} - \vec{d})$$

8.

$$(\vec{a} \times \vec{b}) \times (\vec{c} \times \vec{d})$$