



# FISIKA

VEKTOR

OPERASI VEKTOR

NO. 38

**•38**  For the following three vectors, what is  $3\vec{C} \cdot (2\vec{A} \times \vec{B})$ ?

$$\vec{A} = 2.00\hat{i} + 3.00\hat{j} - 4.00\hat{k}$$

$$\vec{B} = -3.00\hat{i} + 4.00\hat{j} + 2.00\hat{k} \quad \vec{C} = 7.00\hat{i} - 8.00\hat{j}$$

- **Diketahui**
  - Terdapat 3 vektor A, B dan C
- **Ditanya**
  - Hasil  $3\vec{C} \cdot (2\vec{A} \times \vec{B})$
- **Solusi**

$$3\vec{C} \cdot (2\vec{A} \times \vec{B}) = 6\vec{C} \cdot (\vec{A} \times \vec{B})$$

$$(\vec{A} \times \vec{B}) = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ a_x & a_y & a_z \\ b_x & b_y & b_z \end{vmatrix}$$

$$(\vec{A} \times \vec{B}) = \begin{bmatrix} a_y \cdot b_z - a_z \cdot b_y \\ a_z \cdot b_x - a_x \cdot b_z \\ a_x \cdot b_y - a_y \cdot b_x \end{bmatrix}$$

$$(\vec{A} \times \vec{B}) = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 2 & 3 & -4 \\ -3 & 4 & 2 \end{vmatrix}$$

- Solusi

$$\left( \vec{A} \times \vec{B} \right) = \begin{bmatrix} 22 \\ 8 \\ 17 \end{bmatrix}$$

$$6\vec{C} \cdot \left( \vec{A} \times \vec{B} \right) = 6 \begin{bmatrix} 7 \\ -8 \\ 0 \end{bmatrix} \cdot \begin{bmatrix} 22 \\ 8 \\ 17 \end{bmatrix}$$

$$6\vec{C} \cdot \left( \vec{A} \times \vec{B} \right) = 6(7 \cdot 22 - 64)$$

$$6\vec{C} \cdot \left( \vec{A} \times \vec{B} \right) = 540$$



SUMBER:  
Halliday, D., Resnick, R., &  
Walker, J. (2013). *Fundamentals of  
physics*. John Wiley & Sons.

