Vectors **A** and **B** are defined as follows:

$\mathbf{A} = 3\mathbf{i} + 4\mathbf{j} - \mathbf{k}$

$\mathbf{B} = 2\mathbf{i} - \mathbf{j} + 3\mathbf{k}$

Calculate the dot product of vectors **A** and **B**.

$$A \cdot B = (A_x B_x) + (A_y B_y) + (A_z B_z)$$

$$= (3)(2) + (4)(-1) + (-1)(3)$$

$$= 6 - 4 - 3$$

$$\boxed{A \cdot B = -1}$$