Answer on Question #46886 – Math – Vector Calculus

Question:

Find the angle between U =4i - 2j + 4k and V = 3i - 6j - 2k .

680

670

580

690

Solution:

The angle between two vectors is given by the formula:

$$\cos\theta = \frac{\vec{u}\cdot\vec{v}}{|\vec{u}|\cdot|\vec{v}|}$$

where $\vec{u}\cdot\vec{v}$ is dot product, $|\vec{u}|$ is length of vector.

Therefore:

$$\cos\theta = \frac{4\cdot 3+(-2)(-6)+4(-2)}{\sqrt{4^2+(-2)^2+4^2}\sqrt{3^2+(-6)^2+(-2)^2}} = \frac{16}{7\sqrt{29}} \cong 0.38$$

Or:

$$\theta = \arccos 0.424 = 67.6° \cong 68°$$

Answer: $68°$