

3.4-12 Find angle between $A = -2i + j - 2k$ and
 $B = 2i - 2j$

$$A \cdot B = AB \cos \theta$$

$$\cos \theta = \frac{A \cdot B}{AB}$$

$$A \cdot B = (-2)(2) + (1)(-2) + (-2)(0) = -4 - 2 = -6$$

$$A = |A| = \sqrt{(-2)^2 + (1)^2 + (-2)^2} = \sqrt{4 + 1 + 4} = \sqrt{9} = 3$$

$$B = |B| = \sqrt{(2)^2 + (-2)^2} = \sqrt{4 + 4} = \sqrt{8} = 2\sqrt{2}$$

$$\cos \theta = \frac{-6}{3 \cdot 2\sqrt{2}} = \frac{-6}{6\sqrt{2}} = \frac{-1}{\sqrt{2}} = -0.707$$

$$\theta = \cos^{-1}(-0.707) = 135^\circ$$