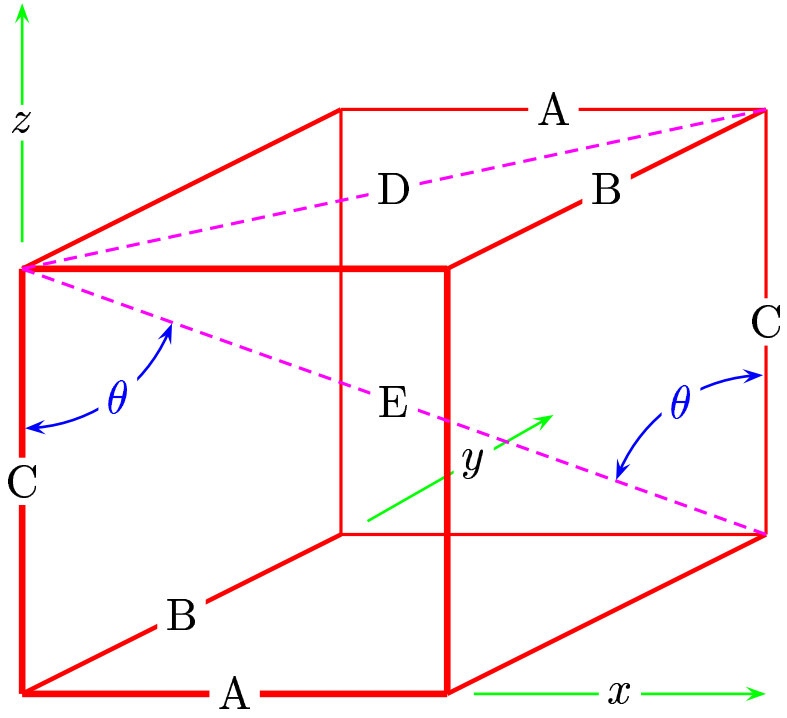
Using the definition of the scalar product of two vectors,



Determine the angle (θ) between the body diagonal (E) of a cube and one of its edges (C).

A) $\theta \simeq 40^\circ$ B) $\theta \simeq 45^\circ$ C) $\theta \simeq 50^\circ$ D) $\theta \simeq 55^\circ$ E) $\theta \simeq 60^\circ$

$$\|\vec{A}\| = 1 \qquad \|\vec{B}\| = 1 \qquad \|\vec{C}\| = 1 \qquad \|\vec{D}\| = \sqrt{2} \qquad \|\vec{E}\| = \sqrt{3}$$

$$\vec{C} \cdot \vec{E} = \|\vec{C}\| \, \|\vec{E}\| \, \cos\theta \,, \quad \text{so}$$

$$1 = \sqrt{3} \, \cos\theta$$

$$\theta = \arccos\left(\frac{1}{\sqrt{3}}\right) = 54.7356^\circ \simeq 55^\circ \,.$$

Answer **C**.

03.03-03-03˙Cube˙diag 2007-6-5