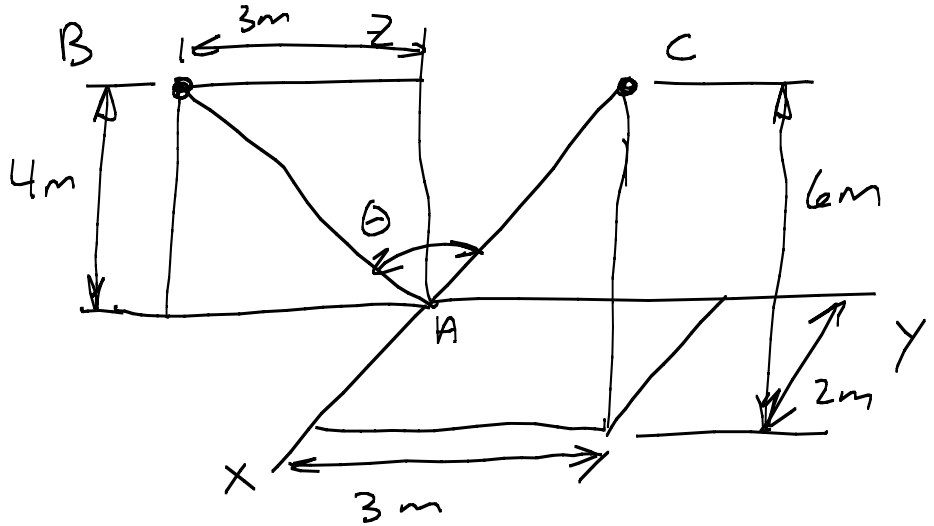
# Problem 2

Given:




Determine: The cangle between AB and AC

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

A(0, 0, 0) m

B(0, −3, 4) m

C(2, 3, 6) m

$$\vec{r}_{AB} = \{0\hat{i} - 3\hat{j} + 4\hat{k}\}\ m$$

$$r_{AB} = \sqrt{(0)^2 + (-3)^2 + (4)^2} = 5\ m$$

$$\vec{r}_{AC} = \{2\hat{i} + 3\hat{j} + 6\hat{k}\}\ m$$

$$r_{AC} = \sqrt{(2)^2 + (3)^2 + (6)^2} = 7\ m$$

$$\cos\theta = \frac{\vec{A}\cdot\vec{B}}{AB} = \frac{\vec{r}_{AB}\cdot\vec{r}_{AC}}{r_{AB}\,r_{AC}}$$

$$\vec{r}_{AB}\cdot\vec{r}_{AC} = (0)(2) + (-3)(3) + (4)(6) = 15\,m^2$$

$$\cos\theta = \frac{15\,m^2}{(5m)(7m)}$$

$$\boxed{\theta = 64.6^\circ}$$