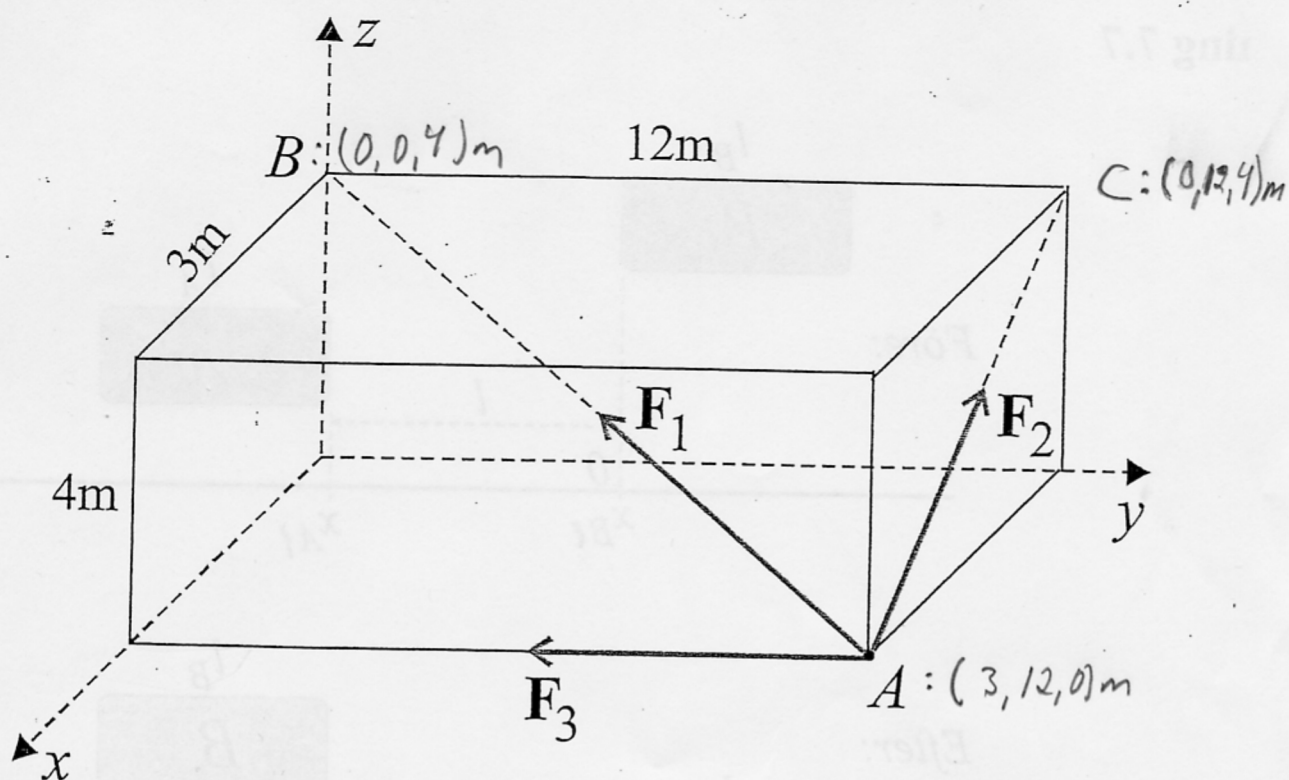


1.4



$$\vec{F}_1 = F_1 \vec{e}_{AB} \quad \vec{F}_2 = F_2 \vec{e}_{AC} \quad \vec{F}_3 = -F_3 \vec{e}_y$$

$$\vec{e}_{AB} = \frac{\vec{r}_{AB}}{r_{AB}} = \frac{(0, 0, 4)\text{m} - (3, 12, 0)\text{m}}{|(0, 0, 4) - (3, 12, 0)|\text{m}} = \frac{(-3, -12, 4)}{\sqrt{9+144+16}} = \frac{(-3, -12, 4)}{13}$$

$$\vec{e}_{AC} = \frac{\vec{r}_{AC}}{r_{AC}} = \frac{(0, 12, 4)\text{m} - (3, 12, 0)\text{m}}{|(0, 12, 4) - (3, 12, 0)|\text{m}} = \frac{(-3, 0, 4)}{5}$$

$$\vec{F}_1 = 260\text{N} \frac{(-3, -12, 4)}{13} = 20(-3, -12, 4)\text{N}$$

$$\vec{F}_2 = 75\text{N} \frac{(-3, 0, 4)}{5} = 15(-3, 0, 4)\text{N}$$

$$\vec{F}_3 = -60(0, 1, 0)\text{N}$$

$$\vec{F} = \vec{F}_1 + \vec{F}_2 + \vec{F}_3 = (-60, -240, 80)\text{N} + (-45, 0, 60)\text{N} + (0, -60, 0)\text{N}$$

$$\boxed{\vec{F} = (-105, -300, 140)\text{N}}$$

$$F = \sqrt{(-105)^2 + (-300)^2 + 140^2}\text{N} = 347.3\text{N}$$

$$\vec{F} \cdot \vec{e}_x = F \cos \alpha$$

$$\cos \alpha = \frac{\vec{F} \cdot \vec{e}_x}{F} = \frac{-105}{347.3} \Rightarrow \alpha = 107.6^\circ$$

$$\vec{F} \cdot \vec{e}_y = F \cos \beta$$

$$\cos \beta = \frac{\vec{F} \cdot \vec{e}_y}{F} = \frac{-300}{347.3} \Rightarrow \beta = 149.7^\circ$$

$$\vec{F} \cdot \vec{e}_z = F \cos \gamma$$

$$\cos \gamma = \frac{\vec{F} \cdot \vec{e}_z}{F} = \frac{140}{347.3} \Rightarrow \gamma = 66.2^\circ$$

GK