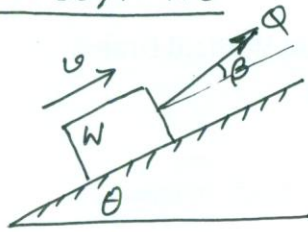


#1383/P.416

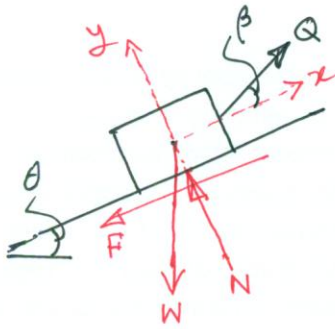


$$W = 100 \text{ lb} \quad \theta = 30^\circ$$

$$Q = 120 \text{ lb} \quad \beta = 15^\circ$$

$$f = \frac{1}{4} \quad S = 8' \text{ up the plane}$$

Net work done = ?
velocity increases? or decreases?

Solⁿ

$$\Sigma F_y = 0, \text{ +ve } y \text{ as direction +ve}$$

$$\Rightarrow N + Q \sin \beta - W \cos \theta = 0$$

$$\Rightarrow N + 120 \sin 15^\circ - 100 \cos 30^\circ = 0$$

$$\therefore N = 55.54 \text{ lb}$$

$$\therefore F = 55.54 \times \frac{1}{4} = 13.89 \text{ lb}$$

$$R_x = Q \cos \beta - F - W \sin \theta$$

$$= 120 \cos 15^\circ - 13.89 - 100 \times \sin 30^\circ$$

$$= 52.02 \text{ (towards +ve } x)$$

$$R_y = 0$$

$$R = \sqrt{R_x^2 + R_y^2} = 52.02 \text{ lb (towards +ve } x)$$

$$\text{Net work done} = 52.02 \times 8 = 416.16 \text{ ft-lb}$$

Since the work done is +ve, the velocity will increase.