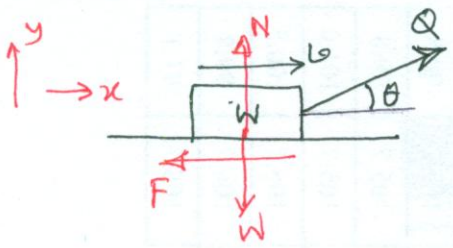
#1381/P.416



$W = 100$ lb

$Q = 50$ lb

$f = \frac{1}{4}$, $\theta = 30^\circ$

$v_0 = 28$ fps, $S = 20$ ft.

Resultant force = ?

Net work done = ?

Soln

$\Sigma F_y = 0 \uparrow +ve$

$\Rightarrow N + Q \sin\theta = W$

$\therefore N = W - Q\sin\theta = 100 - 50 \sin 30^\circ = 75$

$\therefore F = N \cdot f = 75 \times \frac{1}{4} = 18.75$ lb

Resultant force, $R = Q\cos\theta - F$

$= 50 \cos 30^\circ - 18.75$

$= 24.55$ lb

Net Work done $= R \cdot S = 24.55 \times 20$ ft-lb

$= 491$ ft-lb.

Work done by horizontal component of $Q = +Q\cos\theta \times S$

$= +50 \cos 30^\circ \times 20$

$= +866$ ft-lb

Work done by frictional resistance, $F = -F \times S$

$= -18.75 \times 20$

$= -375$ lb

$\therefore$ Net work done $= +866 - 375$ ft-lb

$= 491$ ft-lb