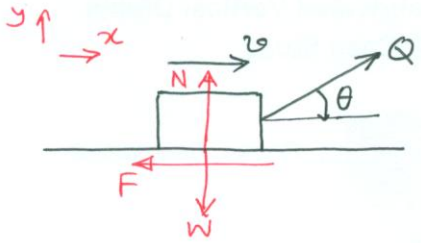
1382/P.416



$W = 100$ lb
$Q = 10$ lb
$f = \frac{1}{4}$, $\theta = 30^\circ$
$v_0 = 28$ fps, $S = 20$ ft.
Net work done = ?
What does -ve work mean?

Soln

$\Sigma F_y = 0 \uparrow +ve$

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

$\therefore N = -10 \sin 30^\circ + 100$

$= +95$ lb

$\therefore F = N \cdot f = 95 \times \frac{1}{4} = 23.75$ lb

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

$= 10 \cos 30^\circ - 23.75$

$= -15.09$ lb

Work done $= R \cdot S$

$= -15.09 \times 20$

$= -301.79$ lb

-ve work means that the direction of resultant force and displacement are opposite. It also means that the resultant force is acting opposite to the velocity.