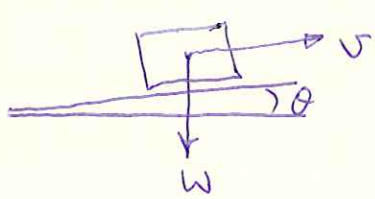


PROB. 13-46

a) $W_w = 120^{lb}$, $W_B = 15^{lb}$, $v = 5 \frac{ft}{s}$, 3% GRADE UP
FIND POWER REQUIRED.

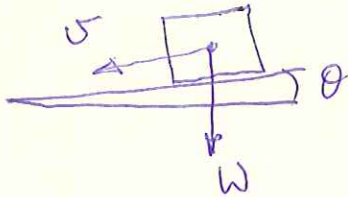


$$\theta = \tan^{-1}\left(\frac{3}{100}\right) = 1.718^\circ$$

$$P = \vec{F} \cdot \vec{v} = (W_w + W_B) \cdot v \sin \theta$$

$$P = (120 + 15^{lb}) \left(5 \frac{ft}{s}\right) \sin(1.718^\circ) = 20.24 \frac{ft \cdot lb}{s}$$

b) $W_m = 180^{lb}$, $W_B = 18^{lb}$, $\theta = 1.718^\circ$, $v = 20 \frac{ft}{s}$
FIND BRAKE POWER



$$P = \vec{F} \cdot \vec{v} = (W_m + W_B) \cdot v \sin \theta$$

$$P = (180 + 18^{lb}) \left(20 \frac{ft}{s}\right) \sin 1.718^\circ = 118.7 \frac{ft \cdot lb}{s}$$