

H W 7

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$P = mg \cdot h = mg \cdot v_y$

$v_y = v \sin \theta = v \cdot \frac{5}{\sqrt{100^2 + 5^2}} \approx v \cdot \frac{100}{5}$

$P = mg \cdot v \cdot \frac{100}{5} = 200 \text{ lb} \cdot 9 \cdot 15 \text{ m/hr} \times \frac{1}{3600}$

$= 90.7185 \text{ kg} \times 9.8 \text{ m/s}^2 \times 6.7056 \text{ m/s} \times \frac{1}{3600}$

$= 298.08 \text{ W} \approx 0.3997 \text{ hp} = 219.73 \text{ lb ft/s}$

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(a)  $W = (70 \text{ lb} \cdot g - 60 \text{ lb}) \times 2 \text{ ft} = \frac{z}{1} (70 \text{ lb} + 60 \text{ lb}) \cdot v^2$

$\therefore v = 3.145 \text{ ft/s}$  or  $0.9587 \text{ m/s}$

(b)  $\frac{z}{1} (70 \text{ lb} \cdot g - 60 \text{ lb}) \cdot 2 \text{ ft} = \frac{z}{1} \times 100 \text{ lb} \times v^2$

$\therefore v = 3.586 \text{ ft/s}$  or  $1.0931 \text{ m/s}$

(a)  $F = R + F_d + G \sin \theta = (50 \text{ lb} + 60 \text{ lb} + 3600 \text{ lb} \times \frac{100}{6}) \times g$

$= 326 \text{ lb} \times g$

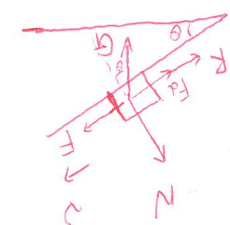
$\therefore P = 326 \text{ lb} \times g \times 65 \text{ mph} = 147.87 \text{ kg} \times 9.8 \text{ m/s}^2 \times 29.0576 \text{ m/s}$

$= 42108.1236 \text{ W} = 56.468 \text{ hp}$

(b)  $F - (R + F_d + G \sin \theta) = ma$   $a = 0.05g$

$\therefore F = 326 \text{ lb} \times g + 3600 \text{ lb} \times 0.05g = 506 \text{ lb} \times g$

$\therefore P = F \times v = 229.52 \text{ kg} \times 9 \times 29.0576 \text{ m/s} = 65359.14 \text{ W} = 87.648 \text{ hp}$



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