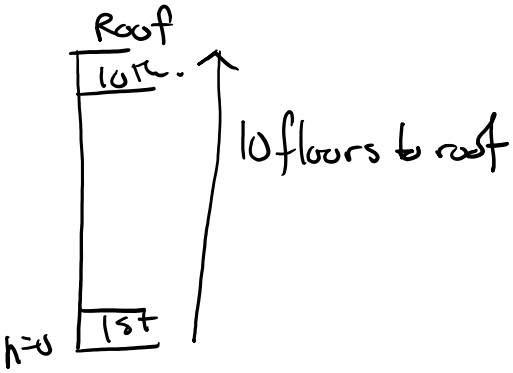
WEP Prodigious Practice Problems Solutions - Potential Energy Section

Thursday, February 1, 2018 2:27 PM

(24) a) $E_p = mgh = 61.2(9.80)(1 \times 2.5)$

$= \boxed{1.5 \times 10^3 \text{ J}}$



b) $E_p = 61.2(9.80)(5 \times 2.5)$

$= \boxed{7.5 \times 10^3 \text{ J}}$

c) $E_p = mg(10 \times 2.5) = \boxed{1.5 \times 10^4 \text{ J}}$

(25) $\Delta E_p = mg\Delta h = 1.00 \times 10^4 \text{ kg}\left(9.80 \frac{\text{N}}{\text{kg}}\right)(-1.00 \times 10^4 \text{ m})$

$\Delta E_p = \boxed{-9.80 \times 10^8 \text{ J}}$

(26) a) $E_p = mg\Delta h = 2.00\text{kg} \times 9.80\frac{\text{N}}{\text{kg}} \times 12.0\text{ m} = \boxed{235 \text{ J}}$

b) $E_p = 2 \times 9.8 \times 3 = \boxed{58.8 \text{J}}$

c) $E_p = 2 \times 9.8 \times 45 = \boxed{88.2 \text{J}}$

d) $E_p = \boxed{0 \text{ J}}$

e) $E_p = 2 \times 9.8 \times -2.50\text{ m} = \boxed{-49.0 \text{J}}$

(27) a) $E_p = mgh \quad h = \frac{E_p}{mg} = \frac{2000 \text{ J}}{1000\text{kg}(9.8\frac{\text{N}}{\text{kg}})} = \boxed{0.204\text{m}}$

b) $h = \frac{200{,}000 \text{ J}}{9800\text{N}} = \boxed{20.4 \text{ m}}$

9800N

c) $h = \frac{3{,}600{,}000\ J}{9800\ N} = \boxed{367\ m}$

(28) $E_p = mgh = 5.00\ kg\left(9.80\ \frac{N}{kg}\right)(3.00\ m) = \boxed{147\ J}$

(29) $E_p = mgh = 10.0\ kg\left(9.80\ \frac{N}{kg}\right)(20.0\ m) = \boxed{1.96 \times 10^3\ J}$

(30) $E_p = mgh = (25\ N)(3.0\ m) = \boxed{75\ J}$

(31) $h = \frac{E_p}{mg} = \frac{300.0\ J}{3.00\ kg\left(9.80\ \frac{N}{kg}\right)} = \boxed{10.2\ m}$