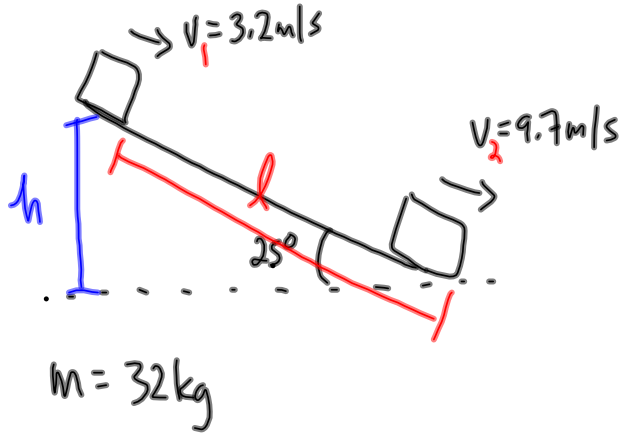


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(top) (bottom)
 $E_{\text{total}} = E'_{\text{total}}$

$$E_{k_1} + E_{g_1} = E_{k_2} + E_{g_2}$$

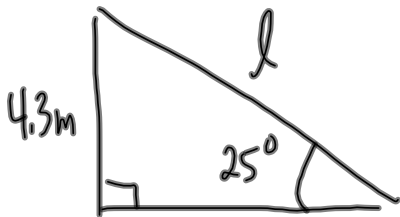
$$\frac{1}{2}mv_1^2 + mgh = \frac{1}{2}mv_2^2$$

$$\frac{1}{2}\left(3.2 \frac{\text{m}}{\text{s}}\right)^2 + \left(9.81 \frac{\text{m}}{\text{s}^2}\right)h = \frac{1}{2}\left(9.7 \frac{\text{m}}{\text{s}}\right)^2$$

$$5.12 \frac{\text{m}^2}{\text{s}^2} + \left(9.81 \frac{\text{m}}{\text{s}^2}\right)h = 47.045 \frac{\text{m}^2}{\text{s}^2}$$

$$\left(9.81 \frac{\text{m}}{\text{s}^2}\right)h = 41.925 \frac{\text{m}^2}{\text{s}^2}$$

$$h = 4.3 \text{ m}$$



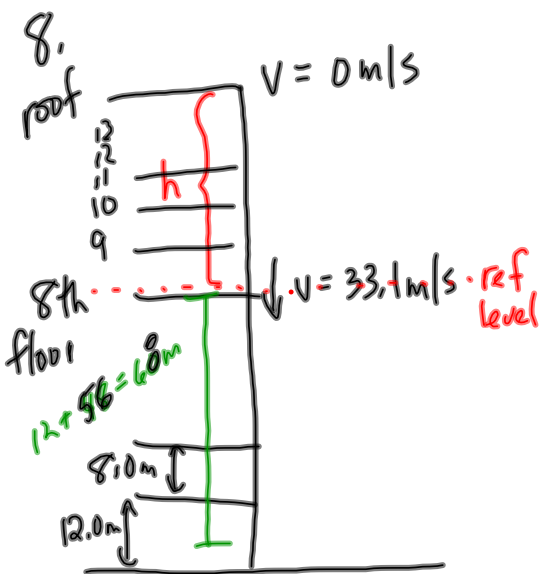
$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\sin 25^\circ = \frac{4.3 \text{ m}}{l}$$

$$l = \frac{4.3 \text{ m}}{\sin 25^\circ}$$

$$l = 10 \times 10^1 \text{ m}$$

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(roof) (at 8th floor) ↑ ref level

$$E_{total} = E'_{total}$$

$$E_g + \cancel{E_k} = \cancel{E_g} + E'_k$$

$$\rho gh = \frac{1}{2} \rho v^2$$

$$h = \frac{v^2}{2g}$$

$$h = \frac{(33.1 \text{ m/s})^2}{2(9.81 \text{ m/s}^2)}$$

$$h = 55.8 \text{ m} \quad (56 \text{ m})$$

At 8th floor At bottom

$$E_g + E_k = E'_g + E'_k$$

$$\rho gh + \frac{1}{2} \rho v_1^2 = \frac{1}{2} \rho v_2^2$$

$$(9.81 \text{ m/s}^2)(60 \text{ m}) + \frac{1}{2} (33.1 \frac{\text{m}}{\text{s}})^2 = \frac{1}{2} v_2^2$$

of floors $\downarrow \div 8$
7 floors