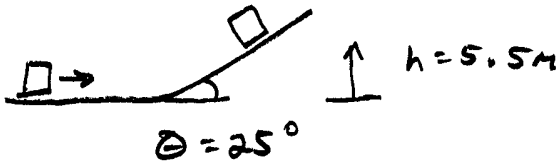# Conservation of energy quiz - Ch, 5

A box slides along a horizontal <u>frictionless surface</u> and then slides up a <u>frictionless incline</u> of 25 degrees. If the box stops 5.5 meters higher than the horizontal surface, what was its initial speed.

$$\theta = 25°$$

$$K_i + \cancel{U_i}^0 = \cancel{K_f}^0 + U_f$$

$$\frac{1}{2} M v_i^2 + 0 = 0 + M g h$$

$$v_i = \sqrt{2 g h}$$

$$= \sqrt{2 \left(9.8 \frac{m}{s^2}\right)\left(5.5 m\right)}$$

$$\boxed{v_i = 10.4 \frac{m}{s}}$$