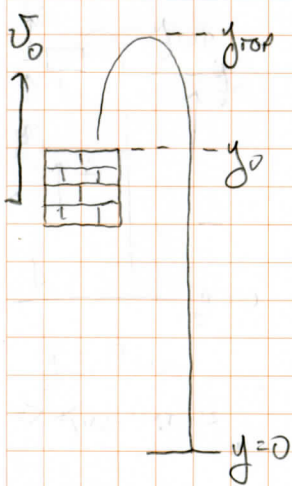


T3 2.52

BRICKS ARE BEING LIFTED AT $v_0 = 5 \frac{m}{s}$. ONE FALLS OFF AT $y_0 = 6m$.



a) FIND MAX HEIGHT OF BRICK = y_{top}

- AT TOP OF FLIGHT, $v_{top} = 0$

$$\Rightarrow v_{top}^2 = v_0^2 - 2g(y_{top} - y_0)$$

$$y_{top} = \frac{v_0^2}{2g} + y_0 = \frac{25}{2(9.8)} + 6 = \boxed{7.28m = y_{top}}$$

b) FIND TIME OF FLIGHT t_f AT $y=0$

$$y = y_0 + v_0 t_f - \frac{1}{2} g t_f^2$$

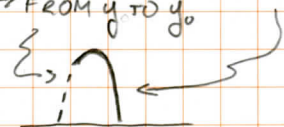
$$\Rightarrow 0 = \frac{1}{2} g t_f^2 - v_0 t_f - y_0 = 4.9 t_f^2 - 5 t_f - 6 = 0$$

USING THE QUADRATIC EQUATION

$$t_f = \frac{5 \pm \sqrt{25 - (4)(4.9)(-6)}}{9.8} = \frac{5 \pm 12}{9.8} = -0.714 \text{ OR } +1.73$$

\swarrow FROM y TO y_0 \nwarrow y_0 TO y

$$\boxed{t_f = +1.73s}$$



c) FIND SPEED WHEN IT HITS THE GROUND = v_{hit}

$$v_H^2 = v_0^2 - 2g(y - y_0)$$

$$v_H^2 = (25) + 2(9.8)(6) = 142.6$$

$$\boxed{v_H = 11.9 \frac{m}{s}}$$