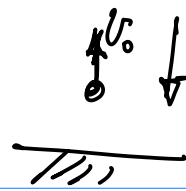


$$v = v_0 + gt$$

$$v^2 = v_0^2 + 2gh$$

$$h = v_0 t + \frac{1}{2} g t^2$$



26) $v_0 = 5 \text{ m/s}$

$h_{\text{max}} = ?$

$$v^2 = v_0^2 - 2gh$$

$$0 = v_0^2 - 2g \cdot h_{\text{max}}$$

$$2gh_{\text{max}} = v_0^2$$

$$h_{\text{max}} = \frac{v_0^2}{2g} =$$

28) $v_0 = 18 \text{ m/s}$

a) $t = ?$ $h = h_{\text{max}}$

b) $h_{\text{max}} = ?$

c) $t = 2 \text{ s}$

$v = ?$, $a = ?$

$$v^2 = v_0^2 - 2gh$$

$$2gh_{\text{max}} = v_0^2 \Rightarrow h_{\text{max}} = \frac{v_0^2}{2g} = 11.47 \text{ m}$$

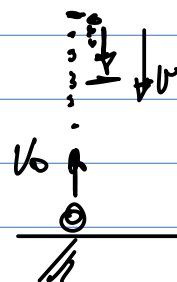
c) $t = 2 \text{ s}$
 $v = v_0 - gt = -4.62 \text{ m/s}$

a) $v = v_0 - gt$

$$0 = v_0 - g \cdot t$$

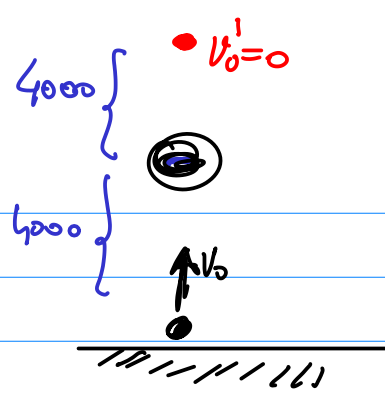
$$gt = v_0 \Rightarrow t = \frac{v_0}{g}$$

$$t = 1.53 \text{ s}$$



DODAWANI 4) $H = 8000m$

$v_0 = ?$



$$h = \frac{gt^2}{2}$$

$$\frac{H}{2} = \frac{gt^2}{2}$$

$$t = \sqrt{\frac{H}{g}} = \underline{\underline{28.56s}}$$

$$h = v_0 \cdot t - \frac{gt^2}{2}$$

$$\frac{H}{2} = v_0 t - \frac{gt^2}{2}$$

$$v_0 t = \frac{H}{2} + \frac{gt^2}{2}$$

$$v_0 = \frac{1}{2t} (H + gt^2)$$

$$v_0 = \frac{1}{2 \cdot 28.56s} (8000m + 9.8 \frac{m}{s^2} \cdot 28.56^2)$$

$$\underline{\underline{v_0 = 280 \frac{m}{s}}}$$

6) $H = 25m$

$h = 15m$

$t = ?$



$$s = v_0 t + \frac{1}{2} gt^2$$

$$(H - h) = v_0 t + \frac{gt^2}{2} \quad | \cdot 2$$

$$v^2 = v_0^2 + 2gh$$

$$v^2 = 2gh$$

$$\underline{\underline{v = \sqrt{2gh} = 17.16 \frac{m}{s}}}$$

$$\frac{gt^2}{2} + 2v_0 t - 2(H - h) = 0$$

$$t_{1/2} = \frac{-2v_0 \pm \sqrt{4v_0^2 + 4g \cdot 2(H-h)}}{2g} \quad ax^2 + bx + c = 0$$

$$x_{1/2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$t_{1/2} = \frac{-2 \cdot 17.16 \pm \sqrt{4 \cdot 17.16^2 + 8 \cdot 9.81 \cdot 10}}{2 \cdot 9.81}$$

$$t_{1/2} = \frac{-34.32 \pm \sqrt{1962}}{19.62} = \frac{-34.32 \pm 44.3}{19.62}$$

$$t = 0.51 \text{ s}$$

7)

$$v_0 = 10 \text{ m/s}$$

$$H = 120 \text{ m}$$

$$v = ?$$

$$t = ?$$

$$v^2 = v_0^2 + 2gH$$

$$v^2 = 100 \text{ m}^2/\text{s}^2 + 2 \cdot 9.81 \text{ m/s}^2 \cdot 120 \text{ m}$$

$$v = 49.54 \text{ m/s}$$

$$v = v_0 + gt \Rightarrow t = \frac{v - v_0}{g}$$

$$t = 4.03 \text{ s}$$

$$a = \frac{\Delta v}{\Delta t} = \frac{v - v_0}{t} \quad \left[\frac{\text{m}}{\text{s}^2} \right]$$

$$v = v_0 \pm a \cdot t$$

$$v^2 = v_0^2 \pm 2as$$

$$s = v_0 t \pm \frac{1}{2} a t^2$$

4)

$$t = 29 \text{ s}$$

$$v = 260 \frac{\text{km}}{\text{h}} = 72.2 \frac{\text{m}}{\text{s}}$$

$$v_0 = 0$$

$$a = ?$$

$$a = \frac{v - v_0}{t} = 2.48 \frac{\text{m}}{\text{s}^2}$$

7)

$$v_0 = 56 \frac{\text{km}}{\text{h}}$$

$$v = 0$$

$$s = 12 \text{ m}$$

$$v_0' = 113 \frac{\text{km}}{\text{h}} = 31.38 \frac{\text{m}}{\text{s}}$$

$$s' = ?$$

$$v^2 = v_0'^2 - 2as' = 0$$

$$2as' = v_0'^2$$

$$a = \frac{v_0'^2}{2s}$$

$$a = \frac{(15.5 \frac{\text{m}}{\text{s}})^2}{2 \cdot 12 \text{ m}}$$

$$a = 10 \frac{\text{m}}{\text{s}^2}$$

$$v_0'^2 = v_0'^2 - 2as'$$

$$2as' = v_0'^2$$

$$s' = \frac{v_0'^2}{2a}$$

$$s' = \frac{(31.38 \frac{\text{m}}{\text{s}})^2}{2 \cdot 10 \frac{\text{m}}{\text{s}^2}}$$

$$s' = 49.23 \text{ m}$$

$$19) \quad l = 7m = s_1$$

$$v_0 = 0$$

$$t_1 = 0.35s$$

$$v_1 = ?$$

$$t = 2s$$

$$h = ?$$

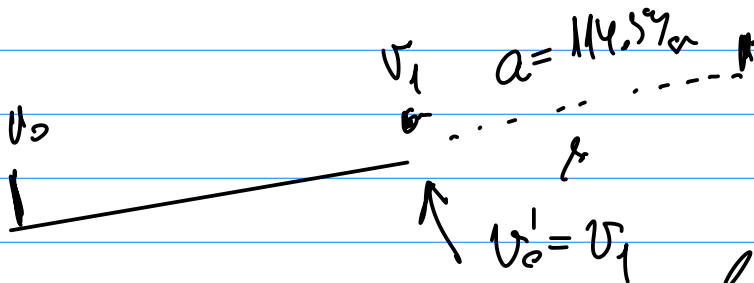
$$s_1 = v_0 t + \frac{a t_1^2}{2}$$

$$a t_1^2 = 2 \cdot s_1$$

$$a = \frac{2s_1}{t_1^2} = \frac{14m}{(0.35s)^2} = 114.3 \frac{m}{s^2}$$

$$v_1 = v_0 + a \cdot t_1$$

$$v_1 = 114.3 \frac{m}{s^2} \cdot 0.35s = \underline{40} \frac{m}{s}$$



$$s = v_0' \cdot t + \frac{a \cdot t^2}{2}$$

$$s = 80m$$

$$22) \quad v_0 = 0$$

$$h = 100m$$

$$v = ?$$

$$v^2 = v_0^2 + 2gh$$

$$g = 9.81 \frac{m}{s^2}$$

$$v = \sqrt{2gh} = 44.29 \frac{m}{s}$$

$$23) \quad t = 5s$$

$$h = ?$$

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

$$h = \frac{9.81 \cdot 25}{2} = \underline{\underline{122.62m}}$$

$$28) \quad v_0 = 15 \frac{m}{s}$$

$$a) \quad t = ? \quad h = h_{max}$$

$$b) h_{\max} = ?$$

$$c) t' = 2s$$

$$v' = ?$$

$$a' = ?$$

$$a) \cancel{v} = v_0 - gt$$

$$0 = v_0 - g \cdot t$$

$$t = \frac{v_0}{g} = \underline{\underline{1.53s}}$$

$$b) v^2 = v_0^2 - 2gh$$

$$0 = v_0^2 - 2gh_{\max}$$

$$h_{\max} = \frac{v_0^2}{2g} = \underline{\underline{11.5m}}$$

$$c) v' = v_0 - gt'$$

$$v' = 15 \frac{m}{s} - 9.8 \frac{m}{s^2} \cdot 2s$$

$$v' = \underline{\underline{-4.8 \frac{m}{s}}}$$