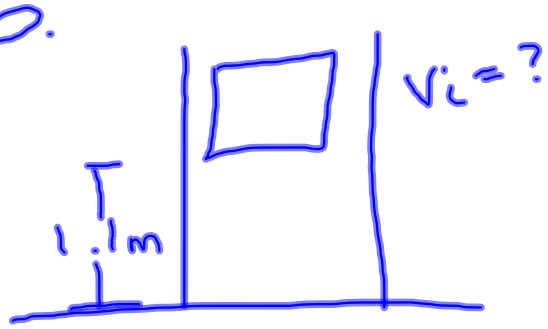
6.



$\Delta y = -1.1\text{m}$

$t = 0.900\text{ s}$

$a = -9.8\text{ m/s}$

$\Delta y = v_0 t + \frac{1}{2} a t^2$

$-1.1 = v_0(0.9) + \frac{1}{2}(-9.8)(0.9)^2$

$-1.1 = 0.9v_0 - 3.969$

$2.869 = 0.9v_0$

$v_0 = 3.19\text{ m/s}$

8.

$v_f^2 = v_0^2 + 2a\Delta x$

$v_f = v_0 + at$

$a = -9.8\ m/s^2$

$v_i = 12.0\ m/s$

$v_f = 0\ m/s$

$0 = 12 - 9.8t$

$-12 = -9.8t$

$t = 1.22\ s$

$0 = 12^2 + 2(-9.8)\Delta x$

$0 = 144 - 19.6\Delta x$

$-144 = -19.6\Delta x$

$\Delta x = 7.35\ m$

$h = \Delta x + x_i$

$h = 7.35m + 1.75m = 9.1m$

7.

A

$\Delta y = -15\,m$

$a = -9.8\,m/s^2$

$v_0 = 12\,m/s$

$v_f =$

$\therefore v_f^2 = v_0^2 + 2a\Delta x$

$v_f^2 = 144 + 2(-9.8)(-15)$

$v_f^2 = 144 + 294$

$v_f^2 = 438$

$v_f = -20.93\,m/s$

$v_f = v_0 + at$

$-20.93 = 12 - 9.8t$

$t_a = 3.36$

B

$\Delta y = -15\,m$

$a = -9.8\,m/s^2$

$v_0 = -12\,m/s$

$v_f = -20.93\,m/s$

$v_f^2 = v_0^2 + 2a\Delta x$

$v_f^2 = 144 + 2(-9.8)(-15)$

$\therefore v_f = -20.93\,m/s$

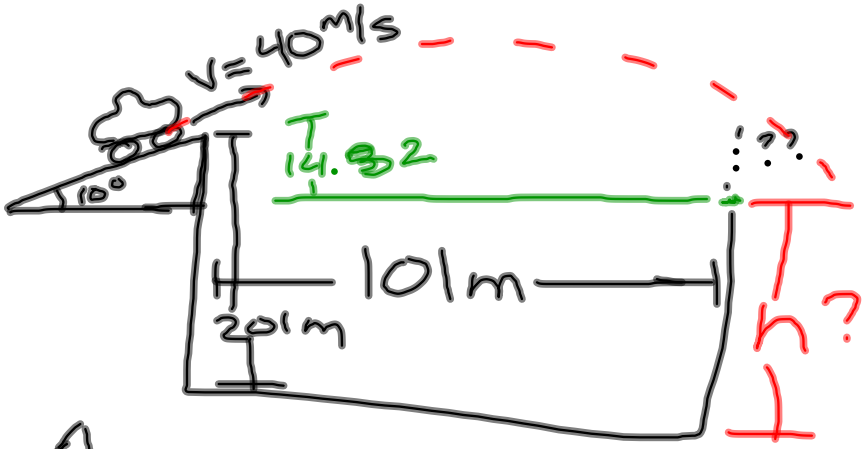
$v_f = v_0 + at$

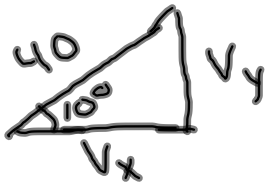
$-20.93 = -12 - 9.8t$

$-8.93 = -9.8t$

$t_b = 0.91\,s$

16.





$V_y = 40 \sin 10 = 6.95 \text{ m/s} \uparrow$

$V_x = 40 \cos 10 = 39.39 \text{ m/s} \rightarrow$

X

$V_i = 39.39 \text{ m/s}$

$a = 0 \text{ m/s}^2$

$\Delta x = 101 \text{ m}$

Y

$V_i = 6.95 \text{ m/s}$

$a = -9.8 \text{ m/s}^2$

$\Delta y = ??$

$t = 2.56 \text{ s}$

$\Delta x = V_0 t + \frac{1}{2} a t^2$ (the $\frac{1}{2}at^2$ term ^{0})

$101 = 39.39\, t$

$t = 2.56 \text{ s}$

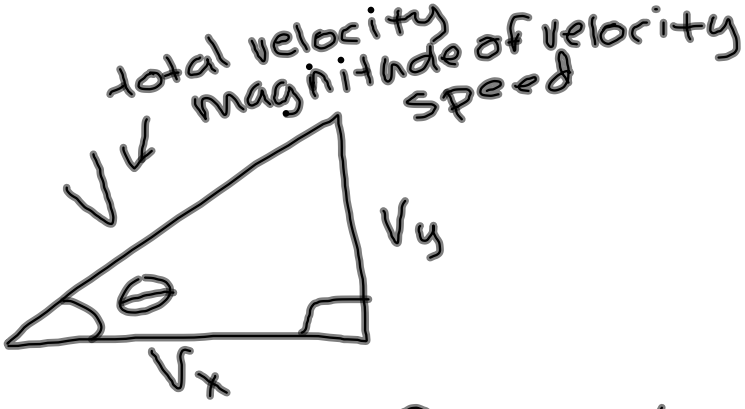
$\Delta y = V_0 t + \frac{1}{2} a t^2$

$\Delta y = 6.95(2.56) - 4.9(2.56)^2$

$\Delta y = -14.3 \text{ m}$

max height of other diff

$20 \text{m} - 14.3 \text{m} =$ **186.7 m**



$$V_x^2 + V_y^2 = V^2$$

$$\tan\theta = \frac{V_y}{V_x}$$

$$V_y = V\sin\theta$$

$$V_x = V\cos\theta$$