

$$v_{2v}^2 = v_{1v}^2 + 2a \Delta d$$

$$= 2(-9.8 \text{ m/s}^2)(593 \text{ m})$$

$$v_{2v} = -107.8 \text{ m/s}$$

$$v_p = 114 \text{ m/s} [72 \text{ BH}]$$

$$\Delta d_v = 593 \text{ m}$$

$$v_{1v} = 0$$

$$\Delta d = v_{1v}t + \frac{1}{2}at^2$$

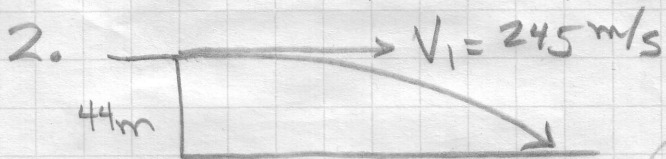
$$t = \sqrt{\frac{2\Delta d}{a}}$$

$$= \sqrt{\frac{2 \times 593}{9.8 \text{ m/s}^2}}$$

$$= 11.0 \text{ secs}$$

$$\Delta d_H = v_{1H}t = 36.0 \text{ m/s} \times 11 \text{ s}$$

$$= 396 \text{ m}$$



$$\Delta d_v = v_{1v}t + \frac{1}{2}at^2$$

$$-44 \text{ m} = -4.9 \text{ m/s}^2 t^2$$

$$t = \sqrt{\frac{44}{4.9}}$$

$$t = 3.0 \text{ s}$$

$$\Delta d_H = v_{1H}t$$

$$= 245 \text{ m/s} \times 3.0 \text{ s}$$

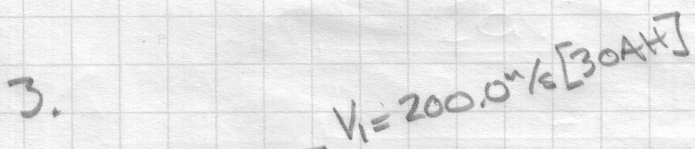
$$\Delta d_H = 734 \text{ m}$$

$$v_{2v}^2 = v_{1v}^2 + 2a \Delta d$$

$$v_{2v} = \sqrt{2a \Delta d}$$

$$= \sqrt{2 \times 9.8 \text{ m/s}^2 \times 44 \text{ m}}$$

$$v_{2v} = 29 \text{ m/s}$$



$$v_{1v} = 100 \text{ m/s}$$

$$v_{1H} = 173.2 \text{ m/s}$$

$$\Delta d_v = v_{1v}t + \frac{1}{2}at^2$$

$$-125 = 100t - 4.9t^2$$

$$4.9t^2 - 100t - 125 = 0$$

$$t = \frac{100 \pm \sqrt{100^2 - 4(4.9)(-125)}}{9.8}$$

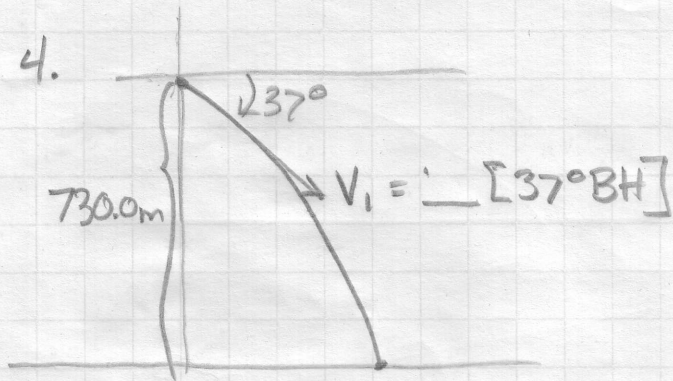
$$t = 21.6, -1.18$$

$$\Delta d_H = v_{1H}t$$

$$= 173.2 \text{ m/s} \times 21.6 \text{ s}$$

$$\Delta d_H = 3740 \text{ m}$$

4.



$$t = 5.0s$$

$$\Delta d = -730.0m$$

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

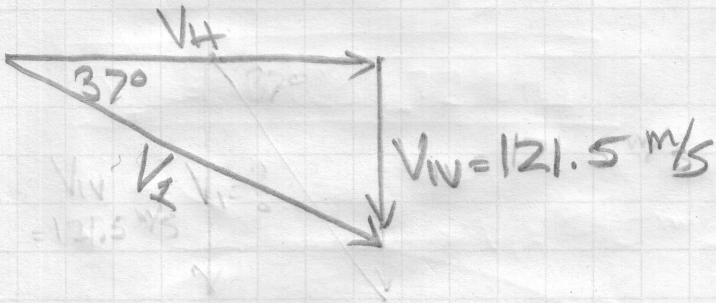
$$\Delta d = v_{iv}t + \frac{1}{2}at^2$$

$$-730.0m = v_{iv}5.0s - (4.9m/s^2)(5s)^2$$

$$-730 = 5v_{iv} - 122.5$$

$$v_{iv} = \frac{-730 + 122.5}{5}$$

$$v_{iv} = 121.5 m/s$$



$$v_i = \frac{v_{iv}}{\sin 37^\circ}$$

$$v_i = 202 m/s [37^\circ BH]$$

$$v_h = \frac{v_{iv}}{\tan 37^\circ}$$

$$v_h = 161.2 m/s$$

$$\Delta d_h = v_h t$$

$$= 161.2 m/s \times 5$$

$$\Delta d_h = 806 m$$

vertically.

$$v_{2v}^2 = v_{iv}^2 + at$$

$$= 121.5^2 + 9.8 \times 5$$

$$v_{2v}^2 = 170.5^2$$

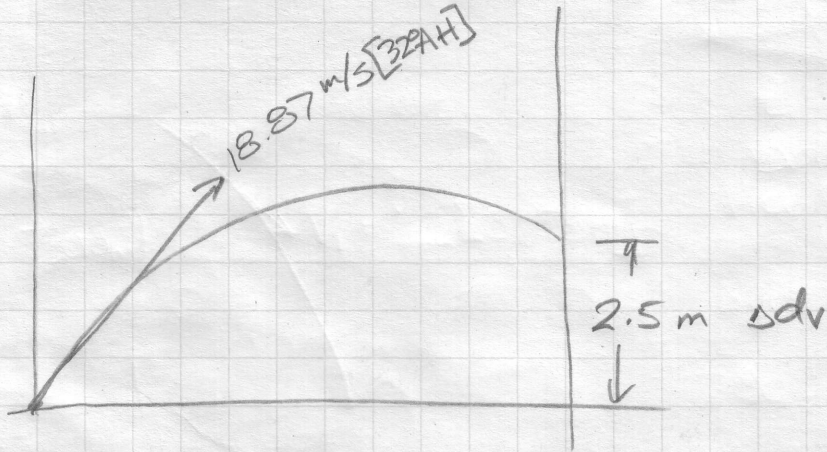
$$v_{2v}^2 = v_{iv}^2 + 2a \Delta d$$

$$= 121.5^2 + 2(9.8)(730)$$

$$v_{2v} = 170.5 m/s$$

$$v_h = 161.2 m/s$$

5.



$$v_{iv} = 10 \text{ m/s}$$

$$v_{H} = 16.0 \text{ m/s}$$

$$\Delta dv = v_{iv}t + \frac{1}{2}at^2$$

$$2.5 \text{ m} = 10.0 \text{ m/s}t - 4.9t^2$$

$$4.9t^2 - 10.0t + 2.5 = 0$$

$$t = \frac{10 \pm \sqrt{10^2 - 4(4.9)(2.5)}}{9.8}$$

$$= \frac{10 \pm 7.14}{9.8}$$

$$t = 1.75, 0.29$$

$$\Delta d_H = v_{H}t$$

$$= 16.0 \text{ m/s} \times 1.75 \text{ s}$$

$$\Delta d_H = 28 \text{ m}$$

$$v_{2f} = \sqrt{v_i^2 + 2a\Delta d}$$

$$= 7.14 \text{ m/s}$$

$$v_H = 16.0 \text{ m/s}$$

$$|v_2| = 17.5 \text{ m/s}$$

6.

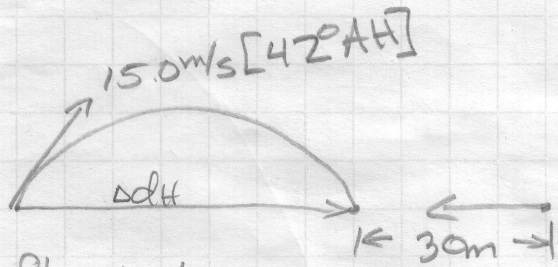
max dist @ 45°

$$d_H = \frac{v_i^2 \sin 2\theta}{g}$$

$$= \frac{(25.0 \text{ m/s})^2}{9.8 \text{ m/s}^2}$$

$$d_H = 63.8 \text{ m}$$

#7.



flight time

$$t = \frac{2v_i \sin \theta}{g}$$

$$= \frac{2 \cdot 15.0 \text{ m/s} \sin 42}{9.8 \text{ m/s}^2}$$

$$= 2.05 \text{ s}$$

$$\Delta dH = \frac{v_i^2 \sin(2\theta)}{g} = 22.8 \text{ m}$$

$$30 \text{ m} - 22.8 = 7.2 \text{ m}$$

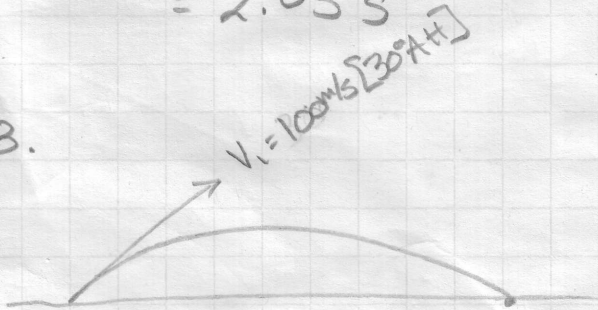
$$v = 7.2 \text{ m} / 2.05 \text{ s} = 3.5 \text{ m/s}$$

run 7.2 m in 2.05 s

$$\therefore \text{speed} = 7.2 \text{ m} / 2.05 \text{ s}$$

$$= 3.5 \text{ m/s (left)}$$

#8.

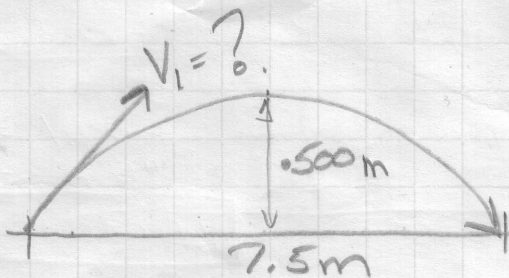


$$t = \frac{2v_i \sin \theta}{g}$$

$$= \frac{2 \cdot 100 \text{ m/s} \sin 30}{10 \text{ m/s}^2}$$

$$t = 10 \text{ secs.}$$

#9.



at peak $v_{2v} = 0$, $a = -9.8 \text{ m/s}^2$, $\Delta dV = +0.50 \text{ m}$
 $\Delta dH = +3.75 \text{ m}$

$$v_2^2 = v_1^2 + 2a\Delta d$$

$$v_1^2 = \sqrt{2a\Delta d}$$

$$= \sqrt{2 \cdot 9.8 \cdot .5}$$

$$v_{1v} = 3.13 \text{ m/s.}$$

$$v_2 = v_1 + at$$

$$t = \frac{v_1}{a}$$

$$= \frac{3.13 \text{ m/s}}{9.8 \text{ m/s}^2}$$

$$= 0.32 \text{ s.}$$

$$v_H = \Delta dH / t$$

$$= 3.75 \text{ m} / 0.32 \text{ s}$$

$$= 11.7 \text{ m/s.}$$

$$v_1 = 12.1 \text{ m/s} [15^\circ \text{ AH}]$$