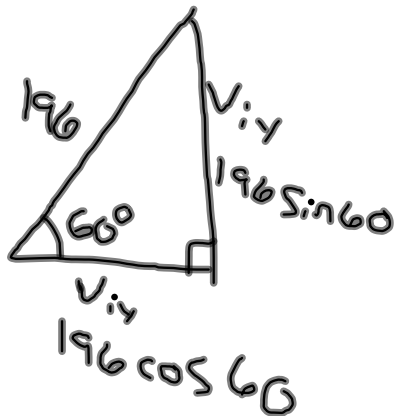


$$V_i = 196 \text{ m/s} \quad V_{iy} = 169.74 \text{ m/s}$$

$$\theta = 60^\circ \quad t = ?$$

$$V_{ix} = 98 \text{ m/s} \quad \Delta x = ?$$



$$0 = 169.74t - 4.9t^2$$

$$0 = t(169.7 - 4.9t)$$

$$t = 0 \text{ or}$$

$$169.7 - 4.9t = 0$$

$$t = \frac{169.7}{4.9}$$

$$t = 34.6$$

$$V_{fy} = -169.74 = 169.74 - 9.8t$$

$$-339.48 = -9.8t$$

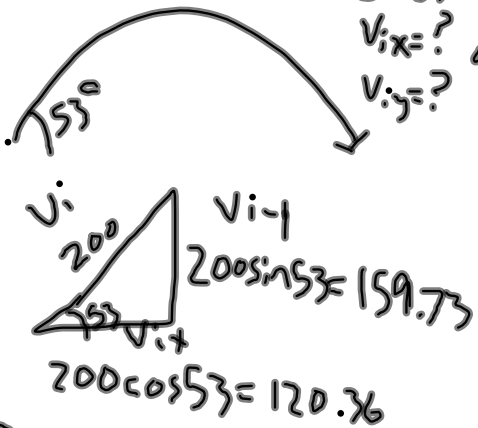
$$34.61 = t$$

$$\Delta x = (98)(34.6)$$

$$\Delta x = 3391.78 \text{ m}$$

16.

$$\begin{aligned} v_i &= 200 \text{ m/s} \\ \theta &= 53^\circ \quad t = ? \\ v_{ix} &= ? \quad \Delta x = ? \\ v_{iy} &= ? \end{aligned}$$



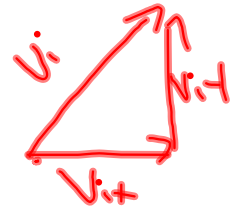
$$v_{fy} = v_{iy} + (-g)t$$

$$0 = 159.73 + (-9)t$$

$$-9.8t = 159.73$$

$$t = 16.3$$

$$t = 32.6 \text{ seconds}$$



$$R = v_{ix} t$$

$$120.36 \times 32.6$$

$$R = 3,923.49 \text{ m}$$



$$V_i = 3 \text{ m/s}$$

$$\Delta y = -1$$

$$\theta = 37^\circ$$

.67
 (.67, -.31)

3
 $3 \cdot \sin(37) = 1.81 \text{ V}_y$
 $3 \cdot \cos(37) = 2.4 \text{ V}_x$

$$-1 = 1.81(t) + (-4.9)(t^2)$$

$$a = -4.9$$

$$a = 4.9, b = 1.81, c = 1$$

$$\frac{-1.81 \pm \sqrt{22.88}}{2(-4.9)}$$

~~1.81~~

$$\frac{-1.81 \pm \sqrt{32.88}}{2(-4.9)}$$

$$\frac{-1.81 \pm \sqrt{1.81^2 - 4 \cdot (-4.9) \cdot (1)}}{2(-4.9)}$$

$$\frac{-1.81 \pm 4.78}{2(-4.9)} =$$

$$-.3 \left(\frac{-1.81 + 4.78}{-9.8} \right)$$

$$\Delta x = 2.4 \cdot .67 = 1.61 \text{ meters}$$

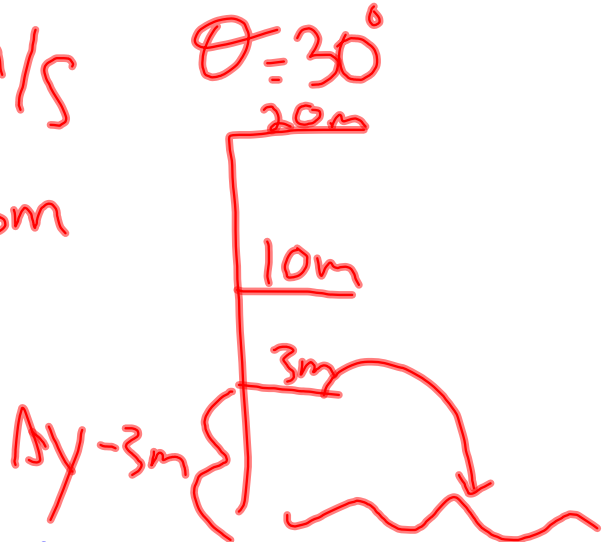
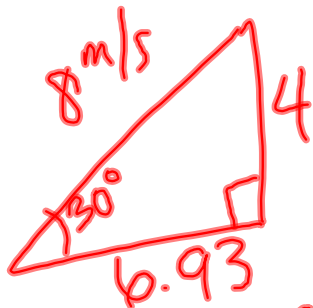
$$+.67 \left(\frac{-1.81 - 4.78}{-9.8} \right)$$



$$v_i = 8 \text{ m/s}$$

$$\theta = 30^\circ$$

$$\Delta y = -3 \text{ m}$$

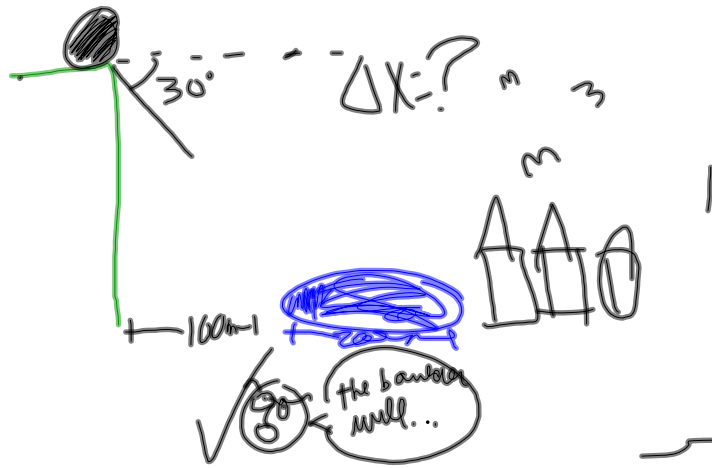


$$-3 = 4t - 4.9t^2 \quad a = -4.9 \quad b = 4 \quad c = 3$$

$$-4 \pm \sqrt{4^2 - 4(-4.9)(3)}$$

$$\frac{-4 \pm 8.65}{2(-4.9)}$$

$$-0.475, 1.29 \text{ s} = t$$



43.301
 30°
 50m/s
 -25
 $-4.9t^2 - 25t + 400$
 $25 \pm \sqrt{625 - 4(-4.9)(400)}$
 -9.81

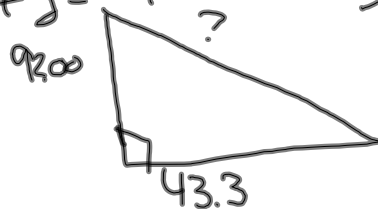
$\frac{25 \pm \sqrt{625 + 7840}}{-9.81} \Rightarrow \frac{25 \pm \sqrt{8465}}{-9.81}$
 $\frac{-67.0}{-9.81} = 6.83 = t$

$d = v \cdot t; d = 43.3(6.83)$

$d = 295.7 \text{ M}$

$V_{fy} = -25 + (-9.81)(6.83)$

$V_{fy} = -92.0023 \text{ m/s}$



$a^2 + b^2 = c^2$

$92^2 + 43.3^2 = c^2$

$10607.69 = c^2$

102.993 m/s