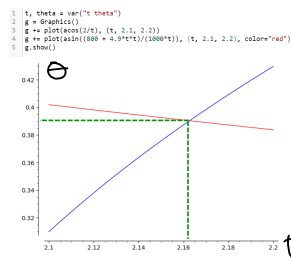


<u>X-dir</u>	<u>Y-dir</u>
$x_i = 0$	$y_i = 0$
$x_f = 2000 \text{ m}$	$y_f = 800 \text{ m}$
$v_{ix} = 1000 \frac{\text{m}}{\text{s}} \cos \theta$	$v_{iy} = 1000 \frac{\text{m}}{\text{s}} \sin \theta$
$a_x = 0$	$a_y = -9.8 \frac{\text{m}}{\text{s}^2}$
$t = ?$	$t = ?$
$v_{fx} = ?$	$v_{fy} = ?$
\Downarrow	\Downarrow
$2000 \text{ m} = 1000 \frac{\text{m}}{\text{s}} \cos \theta t$	$y_f = y_i + v_{iy} t + \frac{1}{2} a_y t^2$
$\theta = \arccos\left(\frac{2}{t}\right)$	$800 \text{ m} = 1000 \frac{\text{m}}{\text{s}} \sin \theta t - 4.9 t^2$
	$\theta = \arcsin\left(\frac{800 + 4.9 t^2}{1000 t}\right)$



$$\Rightarrow \boxed{\theta = 0.39 \text{ rad}}$$

$$(t = 2.1625 \text{ s})$$

Or...

Diagram of a right triangle with hypotenuse t , angle θ , and sides $\frac{t}{2}$ and $\sqrt{t^2 - 2^2}$.

$$\cos \theta = \frac{2}{t}$$

$$\Rightarrow \sin \theta = \frac{\sqrt{t^2 - 2^2}}{t}$$

$$800 = 1000 \left(\frac{\sqrt{t^2 - 2^2}}{t} \right) t - 4.9 t^2$$

$$800 = 1000 \sqrt{t^2 - 2^2} - 4.9 t^2$$

$$(800 + 4.9 t^2)^2 = (1000 \sqrt{t^2 - 4})^2$$

$$640000 + 7840 t^2 + 24.01 t^4 = 1000000 (t^2 - 4)$$

$$T \equiv t^2$$

$$640000 + 7840 T + 24.01 T^2 = 1000000 (T - 4)$$

\Rightarrow Quadratic equation

$$L \rightarrow T \xrightarrow{\sqrt{\cdot}} t \rightarrow \theta$$