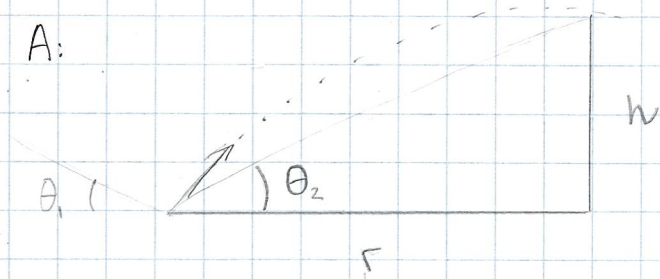


# 20-P: KM-AF-0.13

## Curvilinear Motion: Advanced

Q: [refer to file for exact wording]

A:



$$\theta_2 = \theta_1 + \Delta$$

$$y = y_0 + v_{0y}t + \frac{1}{2}at^2$$

$$h = 0 + v \sin(\theta_2)t - 4.9t^2$$

$$h = v \sin(\theta_2)t - 4.9t^2 \quad (1)$$

$$(1) + (2) \Rightarrow$$

$$x = x_0 + v_x t$$

$$r = 0 + v \cos(\theta_2)t$$

$$(2) \quad r = v \cos(\theta_2)t \Rightarrow \boxed{v = \frac{r}{\cos(\theta_2)t}}$$

$$\Rightarrow h = \frac{r \tan(\theta_2)t}{t} - 4.9t^2$$

$$4.9t^2 = \tan(\theta_2)r - h$$

$$t^2 = [\tan(\theta_2)r - h] / 4.9$$

$$t = \sqrt{[\tan(\theta_2)r - h] / 4.9}$$

$\hookrightarrow$  then use  $t$  to solve for  $v$ .

$$\boxed{V_f = V/A}$$