

20-P-~~AF~~ KM-AF-013

Curvilinear Motion: Advanced

Q: You are 'playing' on the magical trampoline. The trampoline gives energy during impact, meaning you leave at A times the speed v and increases D degrees. The net is B high and C 'long'. Min speed and angle at entry.

A:

$$s = s_0 + v_{0y}t + \frac{1}{2}at^2$$

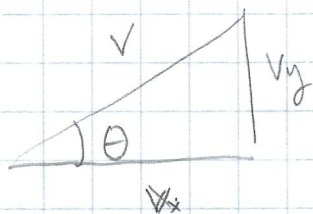
$$0 = B + \cancel{v_{0y}t} + \frac{1}{2}(-9.8)t^2$$

$$0 = B - 4.9t^2 \Rightarrow t^2 = \frac{-B}{-4.9} = \frac{B}{4.9}$$

$$t = \sqrt{B/4.9}$$

$$v_y = B/t$$

$$v_x = C/t$$



$$v = \sqrt{v_y^2 + v_x^2}$$

$$\tan \theta = v_y/v_x$$

$$\theta = (v_y/v_x)^{-1} + D$$

\downarrow A times

$$v = A v_2$$

$$v_2 = \frac{v}{A}$$