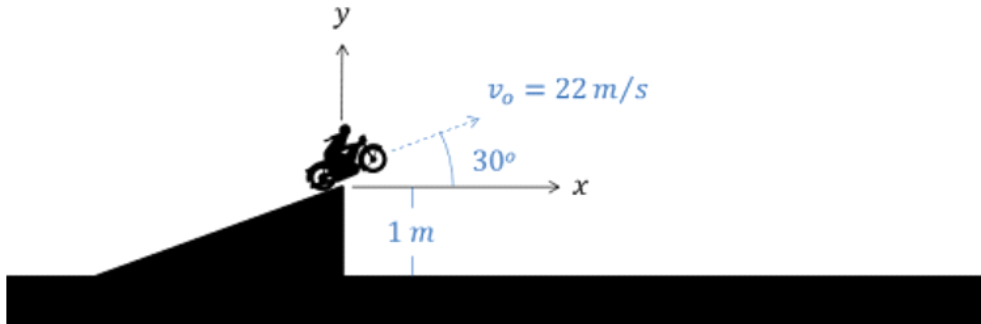


Question 1:

A motorcycle drives off a one meter tall ramp at an angle of 30 degrees as shown below. Determine the equations for the acceleration, velocity, and position over time. How far does the motorcycle in the x direction before hitting the ground?



acc $\ddot{x}(t) = 0$

$$\ddot{y}(t) = -9.81$$

vel $\dot{x}(t) = 22 \cos(30)$

$$\dot{y} = -9.81 t + 22 \sin(30)$$

pos $x(t) = 22 \cos(30) t + \dot{x}$

$$y(t) = -\frac{9.81}{2} t^2 + 22 \sin(30) t + 1$$

find when $y = 0$

$$0 = -\frac{9.81}{2} t^2 + 11 t + 1$$

$$t = 2.33 \text{ s}$$

$$x(2.33) = 22 \cos(30) (2.33) = \boxed{44.4 \text{ m}}$$