HW5-10 Soln)

Let's make upward and forward the positive y and x directions, respectively. Let theta be the angle the string makes with the horizontal.

NII:

$$+T\cos\theta = ma_x$$

$$+T\sin\theta - gm = ma_y = 0$$

Re-arrange and divide the equations:

$$\frac{T\sin\theta}{T\cos\theta} = \frac{gm}{ma_x}$$

$$\tan\theta = \frac{g}{a_x}$$

$$a_x = g\tan\theta = 10\tan(6) = \boxed{1.05}\ m/s^2$$