71. (a) The force which provides the horizontal acceleration v^2/R necessary for the circular motion of radius $R = 0.25$ m is $T \sin\theta$, where T in the tension in the $L = 1.2$ m string and θ is the angle of the string measured from vertical. The other component of tension must equal the bob's weight so that there is no vertical acceleration: $T\cos\theta = mg$. Combining these observations leads to

$$\frac{v^2}{R} = g\tan\theta \quad \text{where} \quad \sin\theta = \frac{R}{L}$$

so that $\theta = \sin^{-1}(0.25/1.2) = 12^\circ$ and $v = \sqrt{gR\tan\theta} = 0.72\,\text{m/s}$. It should be mentioned that Sample Problem 6-11 discusses the conical pendulum.

(b) Thus, $a = v^2/R = 2.1\ \text{m/s}^2$.

(c) The tension is

$$T = \frac{mg}{\cos\theta} = \frac{(0.050)(9.8)}{\cos 12^\circ} = 0.50\ \text{N}\ .$$