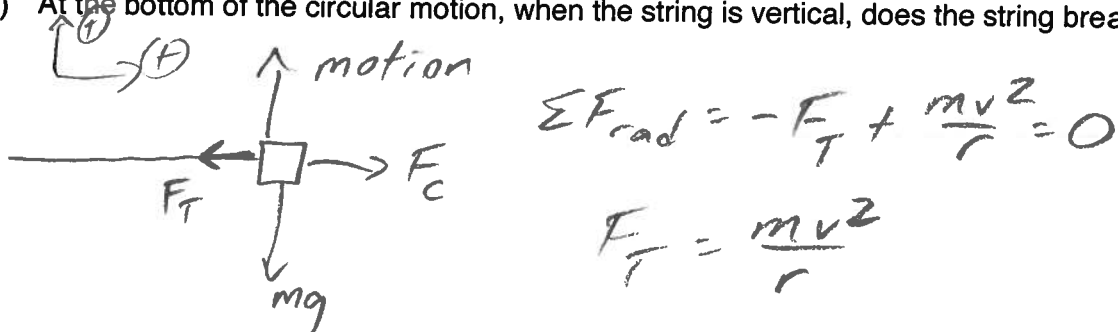


Physics 10154 - Quiz 5A

A 1.2-kg stone is tied to an 85-cm long string and spun around in a vertical circle so that a revolution is completed every 1.8 seconds. The maximum tension that the string can withstand without breaking is 21 Newtons.

- a) What is the tension in the string at the instant the string is horizontal?
b) At the bottom of the circular motion, when the string is vertical, does the string break?

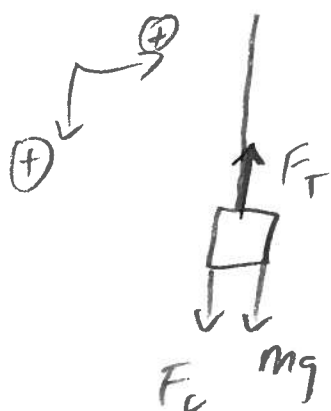


a)

$$v = \frac{2\pi r}{T} = \frac{2\pi (0.85)}{1.8} = 2.97 \text{ m/s}$$

$$F_T = \frac{(1.2)(2.97)^2}{0.85} = \underline{12 \text{ N}}$$

b) At bottom



Since $F_T > 21 \text{ N}$,

string breaks!