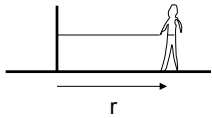
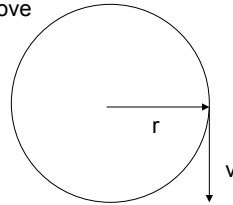


Problem 7.21

from the side



from above

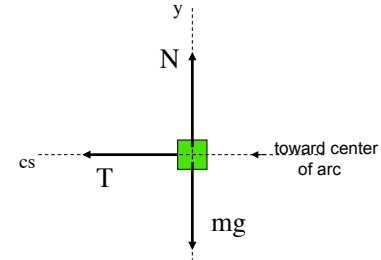


a.) What tension force does the rope exert on the girl?

b.) Compare the force to her weight.

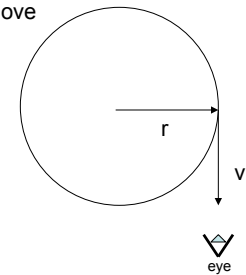
1.

from head-on



$$\begin{aligned}\sum F_{cs} : \\ T &= ma_c \\ &= m \left(\frac{v^2}{R} \right) \\ &= (55 \text{ kg}) \left(\frac{(4 \text{ m/s})^2}{(.8 \text{ m})} \right) \\ &= 1100 \text{ nts}\end{aligned}$$

from above



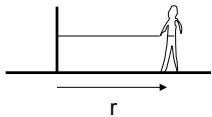
Note that:

$$\begin{aligned}W &= mg \\ &= (55 \text{ kg})(9.8 \text{ m/s}^2) \\ &= 539 \text{ nts, or half the tension force}\end{aligned}$$

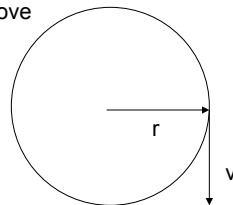
3.)

Problem 7.21

from the side



from above



a.) What tension force does the rope exert on the girl?

It may not be immediately evident how the rope tension is related to anything, but if nothing else at least we know to start with Newton's Second Law and the fact that the motion is circular. With that in mind, we start with a f.b.d. and go from there:

2.