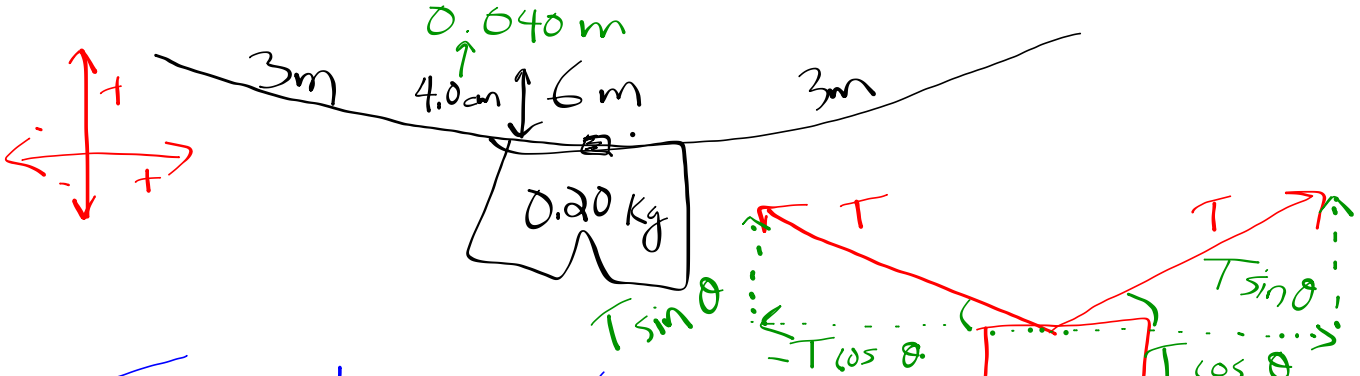
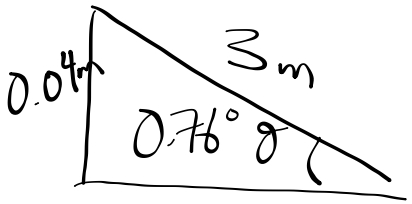
A 0.20 kg bathing suit is hung by a clothespin in the center of a 6.0 m long clothesline that causes the line to sag 4.0 cm. What is the tension in the clothesline? (Hint: Draw a free body diagram of the point of the clothesline from which the bathing suit is hung from. Also, use the dimensions of the problem to find the angle for the tension forces.) [74 N]



$$\Sigma_y = -1.96N + 2(T\sin\theta) = 0$$

$$2T \cdot 2\sin\theta = 1.96$$

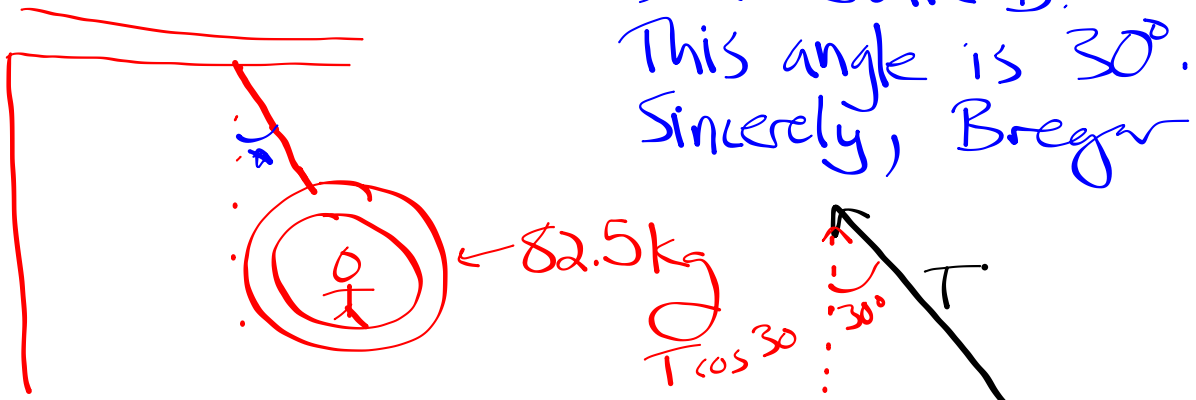
$$T = \frac{0.98}{\sin\theta}$$



$$T = \frac{0.98}{\sin 0.76} =$$

$$\simeq 74\ N$$

A child likes to hang on a tire tied to a tree branch. If the child and tire have a combined mass of 82.5 kg and are pulled back far enough to make an angle of 30.0° with the vertical, what is the tension in the rope supporting her? (Do not worry about the fact that the horizontal forces will not balance. If it makes you feel better, assume someone is holding the child and tire there by applying a horizontal force.) [934 N]



*Dear Julie B.:
This angle is 30°.
Sincerely, Breegr

$\Sigma_y = -808.5N + T\cos 30 = 0$

$T = \frac{808.5N}{\cos 30} = 933.6N$

82.5kg

$mg = 82.5 \cdot 9.8 = 808.5N$