

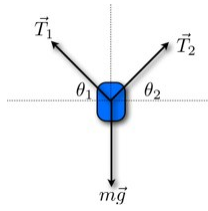
# Tension Forces

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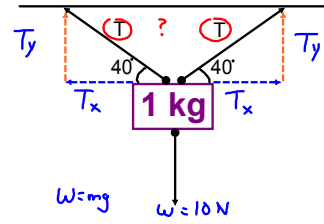
### Objective:

Identify factors that affect the amount of tension in a string.

Calculate the tension in a string supporting an object at an angle.



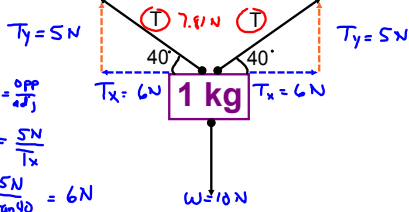
## Tension Forces



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$$T^2 = T_x^2 + T_y^2$$

$$7.81 \text{ N} = \sqrt{6^2 + 5^2}$$



$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan 40^\circ = \frac{5 \text{ N}}{T_x}$$

$$T_x = \frac{5 \text{ N}}{\tan 40^\circ} = 6 \text{ N}$$

## Tension

$$W = m \cdot g$$

vertical: supports weight

$$T_y = \frac{W}{2}$$

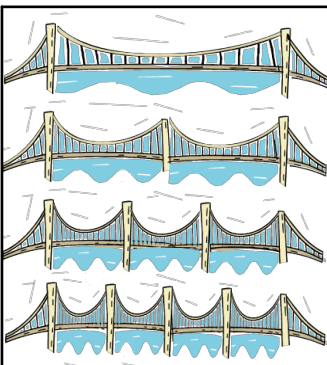
horizontal: 2 sides pull against each other

$$\tan \theta = \frac{T_y}{T_x} \quad T_x = \frac{T_y}{\tan \theta}$$

overall: actual tension in string

(may cause string to break)

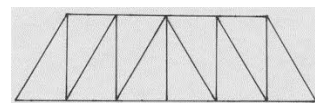
$$T^2 = T_x^2 + T_y^2$$



## Simple Truss

a supporting structure or framework composed of beams or rods commonly of steel or wood lying in a single plane

used for large spans and heavy loads, especially in bridges and roofs



# Tension Forces

## Assignments . . .



- Finish Ch 5 Homework # 1 - 10
- Begin Ch 5 Homework # 11 - 17



$W = m g$   
 $310\text{N} = 31\text{kg} \cdot 10$

$T_x = \frac{T_y}{\tan \theta} = \frac{155\text{N}}{\tan 20^\circ} =$

$T = \sqrt{T_x^2 + T_y^2}$

$T_y = 155\text{N}$       $T = 453\text{N}$       $T = 453\text{N}$       $T_y = 155\text{N}$

$T_x = 426\text{N}$       $T_x = 426\text{N}$

$T_y = \frac{W}{2} = \frac{310\text{N}}{2} =$

$W = 310\text{N}$

Nov 13-9:52 AM