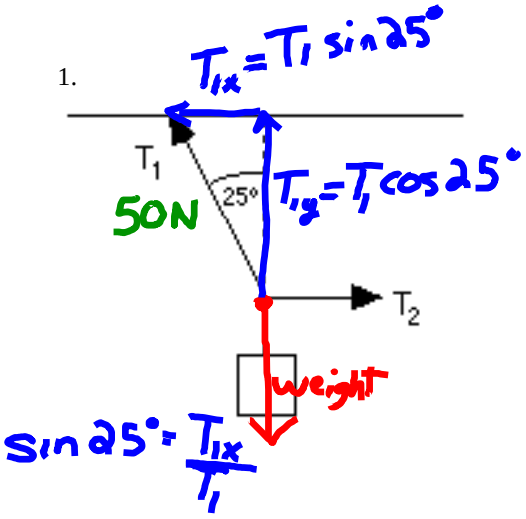
Name _____

Date _____ Hr ____

Forces - Worksheet 1

1.



a) Write the equation which describes the forces which act in the x-direction.

$T_2 = T_{1x}$

$T_2 = T_1 \sin 25°$

b) Write the equation which describes the forces which act in the y-direction.

$T_{1y} = \text{weight}$

$T_1 \cos 25° = \text{weight}$

c) Suppose that the magnitude of T_1 is 50N. Determine the magnitude of T_2.

$T_2 = (50N) \sin 25°$

$T_2 = 21.13N$

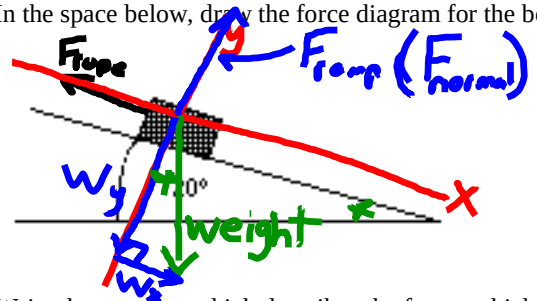
d) Determine the weight of the box. What is its mass?

$\text{weight} = (50N) \cos 25° = 45.3N$

$\text{weight} = m(9.8 \frac{m}{s^2})$

$m = \frac{45.3N}{9.8 \frac{m}{s^2}} = 4.62kg$

2. In the space below, draw the force diagram for the box, which rests motionless on the ramp.



$\sin 20° = \frac{W_x}{W}$

a) Write the equation which describes the forces which act in the x-direction. (Let the x-direction be parallel to the incline and the y-direction be perpindicular to the incline).

$F_{rope} = W_x$

$F_{rope} = W \sin 20°$

b) Write the equation which describes the forces which act in the y-direction.

$F_{ramp} = W_y$

$F_{ramp} = W \cos 20°$

c) If the mass of the box is 8.0 kg, determine the value of the normal force.

$W = (8kg)(9.8 \frac{m}{s^2}) = 78.4N$

$F_{ramp} = (78.4N) \cos 20°$

$F_{ramp} = 73.7N$