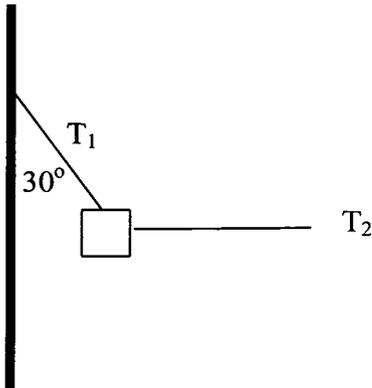


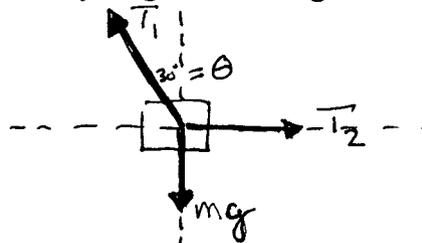
Name: KEY

SP211 Quiz

1. A mass of 5.0 kg is suspended with two cords with Tensions T_1 and T_2 respectively as shown



a. Draw a free body diagram showing all forces on the mass.



b. Write the 2 component equations for Newton's first law. Be sure to make the components of T_1 clear.

$$\sum F_x = T_2 - T_1 \sin \theta = 0$$

$$\sum F_y = T_1 \cos \theta - mg = 0$$

c. What is the magnitude of T_1 ?

$$T_1 = \frac{mg}{\cos \theta} = \frac{(5 \text{ kg})(9.8 \text{ m/s}^2)}{\cos 30^\circ} = \frac{49 \text{ N}}{\sqrt{3}/2} = \frac{98 \text{ N}}{\sqrt{3}} = 56.6 \text{ N}$$

d. What is the magnitude of T_2 ?

$$T_2 = T_1 \sin \theta = \frac{98 \text{ N}}{\sqrt{3}} \cdot \frac{1}{2} = \frac{49 \text{ N}}{\sqrt{3}} = 28.3 \text{ N}$$