

1. If we know an object is moving at constant velocity, we may assume:

- a. the net force acting on the object is zero.
- b. there are no forces acting on the object.
- c. the object is accelerating.
- d. the object is losing mass.

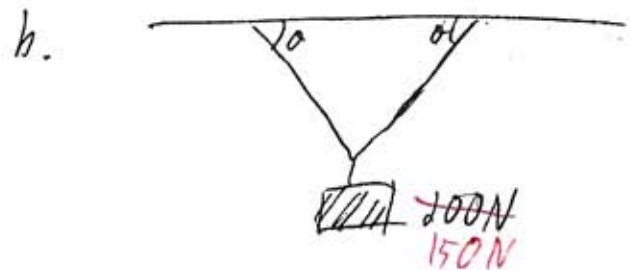
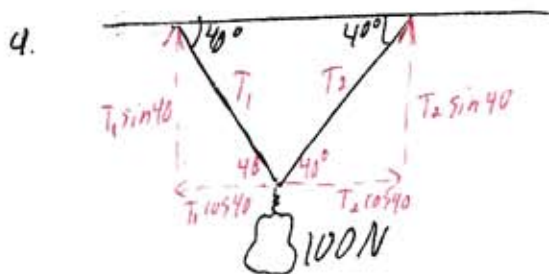
2. What are the dimensions of force?

$$[F] = \frac{ML}{T^2}$$

3. An object is hung from the ceiling of an elevator with the help of a string. The elevator is speeding up. Which of the following is true?

- a) The tension in the string and gravity are a action and reaction pair.
- b) The tension is greater than the weight of the object.
- c) The tension is equal to the weight of the object
- d) The tension is less than the weight of the object

**Problem 4.16**



- a. Find the tension in the two wires that support the 100 N light fixture.
- b. If the fixture was replaced with a 200 N weight, at what angle would the strings have to be oriented in order for the tension in the strings to be the same as the result in part a?

(Find a)

a. horizontal components:

$$T_1 \cos 40 = T_2 \cos 40$$

$$T_1 = T_2$$

vertical component:

$$T_1 \sin 40 + T_2 \sin 40 = 100N$$

$$T_1 = T_2 = \frac{100}{2 \sin 40} N$$

$$= 77.8N$$

horizontal components:

$$T_1 = T_2$$

vertical components:

$$2T \sin \theta = 150$$

$$\theta = \text{Arc Sin} \left( \frac{150}{2(77.8N)} \right)$$

$$\theta = 74.6^\circ$$