Newton's 1st Law Review

1. Define the following terms.
   Mass

   Weight

   Inertia

   Newton's 1st Law

   Net Force

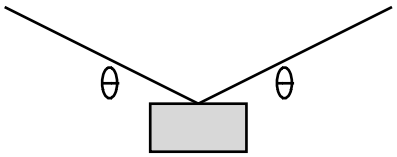
2. What is the weight (on earth) of a 15 kg child?

3. What is the mass (on earth) of a 15 kg child?

4. What is the weight of a 30 kg object on the Moon ($g = 1.6\ m/s^2$)? What is the mass of a 30 kg object on Jupiter ($g = 23\ m/s^2$)?

5. A small box weighs 100 N on Mars ($g = 3.7\ m/s^2$), how much would this box weigh on Earth?

6. Two cables support a 10 N weight as shown to the right. The angles shown are 30°.



   a. What is true about the tension in each cable?

   b. What is true about the sum of the vertical components of tension?

   c. What is true about the sum of the horizontal components of tension?

   d. What would happen to your answers above if the angle were increased?

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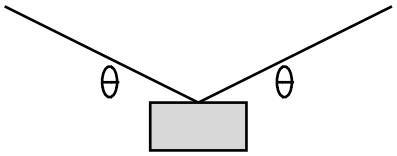
7. Two cables support a mass as shown to the right. The tension in each cable is 12 N. The angles are 35°.



   a. What are the horizontal components of the tensions?

   b. What are the vertical components of the tensions?

   c. What must be the weight of the mass?

   d. What must be the mass?

8. Sketch the following force diagrams.
   a. A toy wagon being pulled to the right at constant speed down a hall.

   b. A rock sliding across a horizontal frictionless surface

   c. A rock suspended by a single string.

   d. A rock suspended by two strings at equal angles from vertical.

9. If an object is at rest, what must be true about the forces acting on it?

10. If an object is moving with a constant velocity, what must be true about the forces acting on it?

11. What units are used to measure:
   a. inertia? b. force? c. acceleration due to gravity?
   d. mass? e. weight?

12. If you are holding up an object, are you experiencing its inertia or its weight? Explain.

13. If you are pushing or shaking an object, are you experiencing its inertia or its weight? Explain.