

**CHAPTER 4 TEST REVIEW**

1. What does it mean that an object is in *equilibrium*? What assumptions could be made about an object that is in equilibrium? (No net force; no force, no acceleration)
2. What is the relationship between force and acceleration? Can you have one without the other? Explain. ( $F = ma$ ; they go together; can't have one without the other. Force and Acceleration directly proportional; mass and acceleration inversely proportional)
3. What is the difference between a field force and a contact force? Give examples. (contact force has physical touch; field force acts without contact; Gravitation, Magnetism, etc...)
4. What is a force? How are they represented? (a push or a pull; represented with vectors; magnitude of force is shown with size of vector)
5. Analyze the picture to the right and identify each of the forces shown. How would you show a horizontal force acting on the television? (normal force = force of table on tv; force of gravity = force tv on the table)

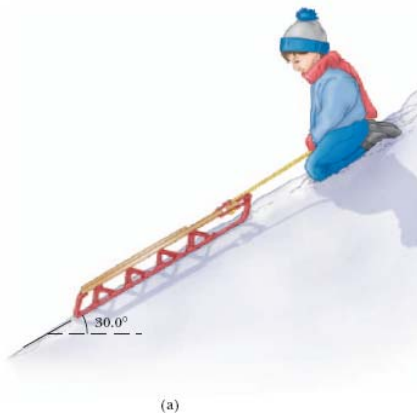
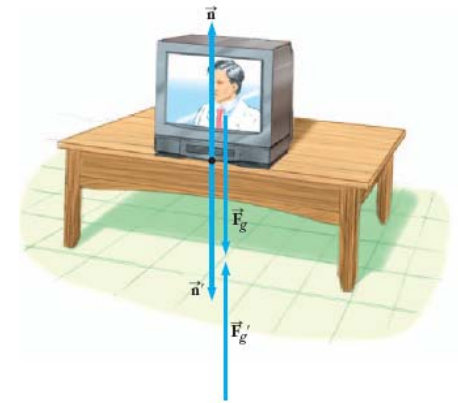


Figure 4.13 (Example 4.6) (a) A child holding a sled on a fri for the sled.

6. A child holds a sled at rest on a frictionless, snow-covered hill, at an angle of  $30^\circ$ , as shown in Figure 4.13a. If the sled weighs 77.0 N, find the force exerted by the rope on the sled and the magnitude of the normal force exerted by the hill on the sled. (38.5 N; 66.7 N)
7. An airboat with mass 295 kg, has an engine that produces a net horizontal force of 770 N after accounting for forces of resistance. What is the acceleration of the boat if it has a 55 kg driver? (2.3  $m/s^2$ )

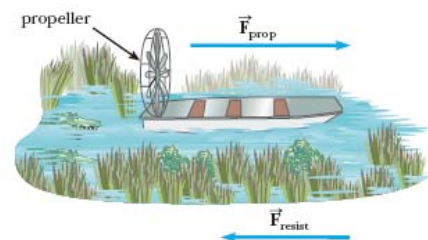


Figure 4.4 (Example 4.1)

8. Superman flies with a force of 50.0 N and perpendicularly hits an asteroid moving with a force of 87 N in order to save the world. What is the resultant force of the asteroid? ( $1.0 \times 10^2$  N or 100 N)
9. What are the three laws of motion? Discuss a situation, for each law of motion, which could be used as an example.
10. What is the difference between mass and weight? Give an example of how the two are different.



11. A late traveler rushes to catch a plane, pulling a suitcase with a force directed  $30.0^\circ$  above the horizontal. If the horizontal component of the force on the suitcase is  $60.6\text{ N}$ , what is the force exerted on the handle? What is the normal force on the suitcase?
12. Find the tension in each cable supporting the  $600\text{-N}$  cat burglar in Figure P4.15.

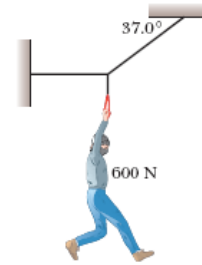


Figure P4.15