Forces WS 1 Answers

1. What is the mass of a dog that weighs 75-N? **7.5 kg**
2. An astronaut with all her equipment has a mass of 95-kg.
   a. How much will she weigh on the Earth? **950 N**
   b. How much will she weigh on the moon where acceleration to gravity is 1.67-m/s^2? **159 N**
3. An object with a mass of 15-kg is observed to accelerate at 3m/s^2. What is the net force on the object? **45 N**
4. A net force of 200-N acts an object with a mass of 40-kg on. What is the acceleration of the object? **5 m/s^2**
5. An object is observed to accelerate at 14 m/s^2 while under the influence of 270-N net force. What is the object's mass? **19.3 kg**
6. A net force of 150-N acts upon an object with a mass of 25-kg for a time period of 4 seconds. What is the acceleration acting on the object? **6 m/s^2**
   a. If the initial velocity of the object is 13-m/s, what is the final velocity? **37 m/s**
   b. What is the distance traveled of the 25-kg object? **48 m**

Forces WS 2 Answers

7. An object with a mass of 9-kg is observed to have an initial velocity of 3 m/s. Twelve seconds later its velocity is 24 m/s. What is the acceleration acting on the object? **1.75 m/s^2**
   a. What must be the force acting on the object during that time? **15.8 N**
   b. If the 9-kg object initial position is 15-m from the reference point, what will be its final position? **177 m**
8. A 95-N force acts upon an object. It is initially at rest and is observed to travels distance of 400-m in 6-seconds. What is the acceleration acting on the object? **22.2 m/s^2**
   a. What is the mass of the object? **4.3 kg**
   b. What is the final velocity of the 95-N object? **133 m/s**
9. A parachutist is falling under the influence of Earth's gravity. His mass is 80-kg.
   a. Neglecting air resistance, what will be his acceleration? **9.81 m/s^2**
   b. What, therefore, is the net force acting on the parachutist (still neglecting air resistance)? **785 N**
   c. Now he opens the parachute, which provides an additional force of 300-N in the opposite direction of gravity. What is the net force acting on the parachutist? **485 N**
   d. With his parachute now open, what will the acceleration be? **6.1 m/s^2**
   e. Repeat # 9 for a parachutist with a mass of 150-kg. Will his acceleration for part d be more, less or the same? Explain.
   f. **9.81 m/s^2** **1470 N** **1170 N** **7.8 m/s^2**
10. A sled is being pulled along a horizontal road at constant speed by means of a rope that makes a 25^o with the horizontal. If the friction between the sled and the snow is 84-N, how much is the forward pull? **84-N**
    a. How much is the tension on the rope? **93-N**
11. A sign is supported as shown; the tension in the rope is 350-N. How much does the sign weigh if the angle between the rope and the wall is 40^o? **268-N**
12. A 20-kg pile of books is resting on a plank tilted so that it makes an angle of 20^o with the ground. How much force do the books exert against the plank? **188-N**
13. A force of 20-N is needed to push a wagon up a frictionless 35^o slope. How much does the wagon weigh? **24- N**