

Forces:

Solve the following problems. Show all work. Remember to include correct units.

1. What is the force on a 1 Kg ball that is falling freely due to the pull of gravity? (Neglect air resistance)

2. A man has a mass of 66 Kg on the earth. What is the man's weight?

3. A girl on roller skates accelerates at a rate of 2 m/s^2 with a force of 100 N. What is the girl's mass?

4. A person weighs 540 N on the earth. What is the person's mass? What would the person weigh on the moon where the acceleration due to gravity is 1.67 N/Kg ?

5. An elevator has a mass of 1000 Kg.

a. What is the tension force on it's cables when it is stationary?

b. What force is needed to accelerate it upward at a rate of 2 m/s^2 ?

c. What force is needed to accelerate it downward at a rate of 2 m/s^2 ?

6. A stationary car with a mass of 1500 Kg reaches a velocity of 15 m/s after 5 seconds. What is the car's acceleration? How much force was required to reach this acceleration?

7. An astronaut has a mass of 50 Kg.

a. How much does she weigh before liftoff?

b. When her space vehicle is 6400 Km above the earth's surface, she will weigh $\frac{1}{4}$ of what she weighed on the earth.

1. What does she weigh at that point in space?

2. What is the acceleration on her mass at that point in space?

8. A 7000 Kg plane is launched from an aircraft carrier in 2 seconds by a force of 350,000 N. What is the plane's acceleration? What is the plane's velocity?