

Name _____

Science

Class _____

Date _____

Homework 3-17: Calculating force

Answer on a separate paper, show all work!

1. Assume that a catcher in a professional baseball game exerts a force of -65.0 N to stop the ball. If the baseball has a mass of 0.145 kg , what is its acceleration as it is being caught?
2. A type of elevator called a *cage* is used to raise and lower miners in a mine shaft. Suppose the cage carries a group of miners down the shaft. If the unbalanced force on the cage is 60.0 N , and the mass of the loaded cage is 1000 kg , what is the acceleration on the cage?
3. A 214 kg boat is sinking in the ocean. The force of gravity that draws the boat down is partially offset by the buoyant force of the water, so that the net unbalanced force on the boat is -1310 N . What is the acceleration of the boat?
4. The gravitational force that Earth exerts on the moon equals $1.98 \times 10^{20}\text{ N}$. The moon's mass equals $7.475 \times 10^{22}\text{ kg}$. What is the acceleration of the moon due to Earth's gravitational pull?
5. The force of gravity between the moon and an object near its surface is much smaller than the force of gravity between Earth and the same object near Earth's surface. A bowling ball with a mass of 7.51 kg is pulled downward with an unbalanced force of 12.2 N . What is the acceleration of the falling bowling ball on the moon?