

Question 1

The Moon orbits the Earth at approximately constant speed and in a circle.

An apple falls straight to the center of the earth.

Which of the following is true?

1. Net force on moon is zero. Net force on apple is zero.
2. Net force on moon is zero. Net force on apple is not zero.
3. Net force on moon is not zero. Net force on apple is zero.
4. Net force on moon is not zero. Net force on apple is not zero.

Question 2

Suppose that a cannonball is fired from a cannon on top of a mountain higher than all others. The cannon points horizontally and can fire the cannonball at various speeds.

Ignoring air resistance, what happens to the cannonball as the launch speed increases?

1. It always hits Earth at the same location.
2. It always hits Earth but at a further distance when fired faster.
3. It can avoid hitting Earth completely.

Question 3

The Earth exerts a gravitational force on an apple near to its surface.

Which of the following is true?

1. Only really heavy objects can exert gravitational forces so the apple does not exert any force on Earth.
2. The apple exerts a force on Earth but this is much less than the force exerted by the Earth on the apple.
3. The apple exerts a force on Earth and this has the same size as the force exerted by the Earth on the apple.
4. The apple can exert gravitational forces but only on smaller objects.