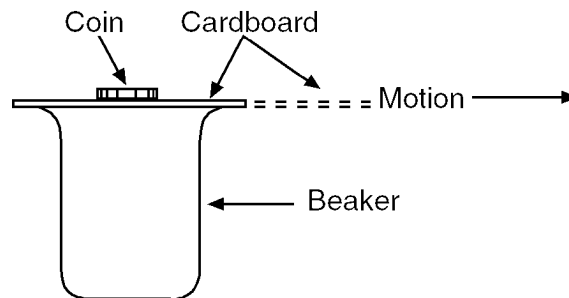
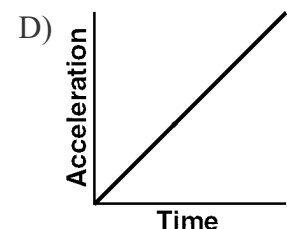
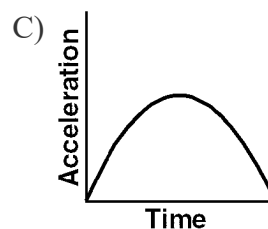
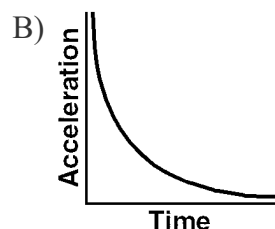
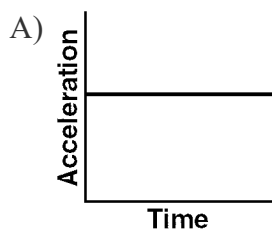


- 1) A rocket in space can travel without engine power at constant speed in the same direction. This condition is *best* explained by the concept of
- A) acceleration                      B) inertia                      C) gravitation                      D) action-reaction
- 2) As the mass of an object decreases, its inertia will
- A) decrease                                      C) increase  
B) remain the same
- 3) If the mass of a moving object could be doubled, the inertia of the object would be
- A) quadrupled                      B) halved                      C) doubled                      D) unchanged
- 4) Compared to the inertia of a 0.10-kilogram steel ball, the inertia of a 0.20-kilogram Styrofoam ball is
- A) one-half as great                      B) twice as great                      C) four times as great                      D) the same
- 5) A copper coin resting on a piece of cardboard is placed on a beaker as shown in the diagram below. When the cardboard is rapidly removed, the coin drops into the beaker.

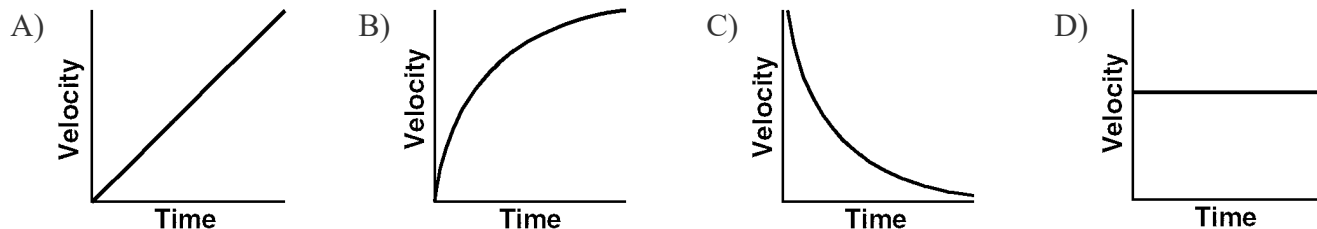


The two properties of the coin which *best* explain its fall are its weight and its

- A) electrical resistance                      B) volume                      C) inertia                      D) temperature
- 6) Compared to the inertia of a 1-kilogram mass, the inertia of a 4-kilogram mass is
- A)  $\frac{1}{4}$  as great                      B) 16 times as great                      C)  $\frac{1}{16}$  as great                      D) 4 times as great
- 7) An object is acted upon by a constant unbalanced force. Which graph *best* represents the motion of the object?

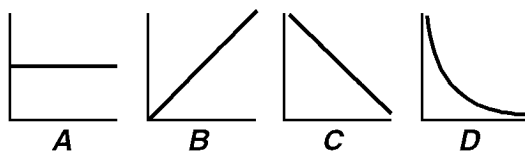


8) Which graph *best* represents the motion of a moving object with *no* unbalanced force acting on it?



Questions 9 and 10 refer to the following:

The graphs below represent various phenomena in physics.



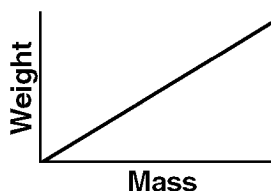
9) Which graph *best* represents the relationship between gravitational force and distance from the Earth for an object traveling away from the Earth?

- A) A                      B) B                      C) C                      D) D

10) Which graph *best* represents the relationship between velocity and time for an object in dynamic equilibrium?

- A) A                      B) B                      C) C                      D) D

11) The graph below shows the relationship between weight and mass for a series of objects.



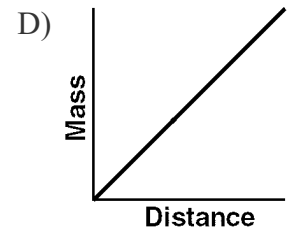
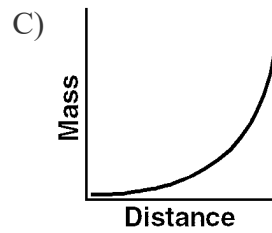
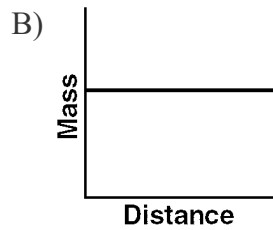
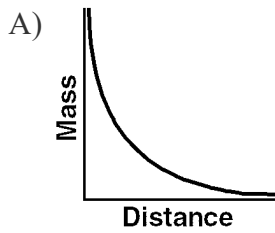
The slope of this graph represents

- A) acceleration due to gravity                      C) change of position  
B) momentum    D) normal force

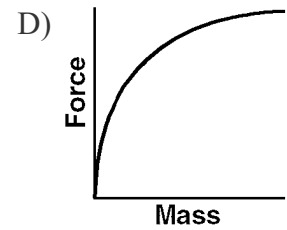
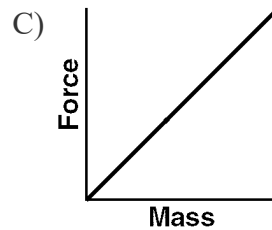
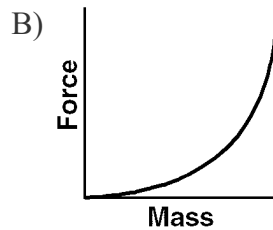
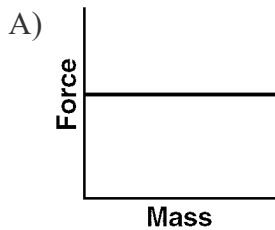
12) On the planet Gamma, a 4.0-kilogram mass experiences a gravitational force of 24 newtons. What is the acceleration due to gravity on planet Gamma?

- A)  $6.0 \text{ m/s}^2$                       B)  $96 \text{ m/s}^2$                       C)  $0.17 \text{ m/s}^2$                       D)  $9.8 \text{ m/s}^2$

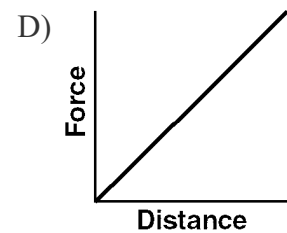
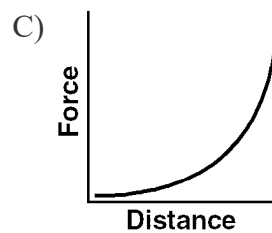
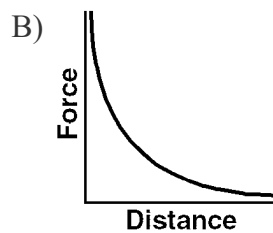
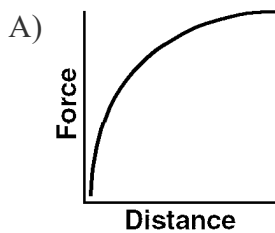
13) Which graph *best* represents the relationship between the mass of an object and its distance from the center of the Earth?



14) Which graph *best* represents the relationship between the masses of different objects and the gravitational force acting on them as they fall freely near the Earth's surface?



15) Which graph *best* represents the gravitational force between two point masses as a function of the distance between masses?



16) If the mass of one of two particles is doubled and the distance between them is doubled, the force of attraction between the two particles will

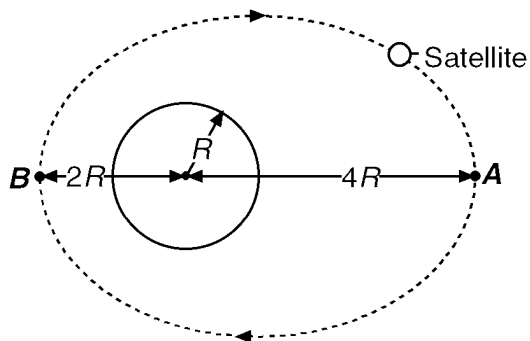
A) increase

B) remain the same

C) decrease

**Question 17 refers to the following:**

The diagram below represents a satellite in an elliptical orbit around the Earth. The highest point,  $A$ , is four Earth radii ( $4R$ ) from the center of the Earth. The lowest point,  $B$ , is two Earth radii ( $2R$ ) from the center of the Earth. The mass of the satellite is  $3.0 \times 10^6$  kilograms.



17) Compared to the magnitude of the force of the satellite on the Earth, the magnitude of the force of the Earth on the satellite is

A) greater

B) less

C) the same