

Physical Science 112 Chapters 8, 9,10,13

Tahsiri

Homework : Chapters, 8, 9

1. What is the average speed of a motorcycle that travels 20 m in 2 s?
a) 40 m/s b) 20 m/s c) 10 m/s d) 9.8 m/s
2. What is the average speed of a car that travels 45 km in 3 h?
a) 135 km/h b) 15 km/h c) 10 km/h d) 9.8 km/h
3. Consider a car that starts at rest and accelerates at 2 m/s^2 for 3 seconds. At that time, $t = 3 \text{ s}$, how fast is it going?
a) 12 m/s b) 9 m/s c) 6 m/s d) 3 m/s
4. A motorcycle accelerates from a standing stop with an acceleration of 5 m/s^2 . How far will it get in 10 seconds in meters?
a. 50 m b. 75 m c. 150 m d. 175 m e. 250 m .
5. All of the following quantities must be represented by vectors except
a. distance. b. velocity. c. acceleration. d. displacement.
6. Which of the following statements is not true?
a. Vector quantities must have magnitude and direction clearly indicated.
b. Scalar quantities can be expressed using only magnitude, that is, a number plus units.
c. Speed is always considered to be a scalar quantity.
d. Scalar quantities, to be complete, must have a direction specified.

7. Which quantity is defined as the distance divided by the time?

a. Vector b. Acceleration c. Velocity d. speed

8. The speedometer on a car is an indicator of the car's

a. vertical velocity. b. average speed.

c. instantaneous speed. d. uniform acceleration.

9. The units associated with velocity is

a. m/s/s b. m-s c. m/s d. M^2/s

10. Acceleration can be expressed in units of

a. m/s b. m-s c. $m-s^2$ d. M/s^2

11. An object falling freely toward the ground in a vacuum near Earth's surface experiences an acceleration that has a magnitude of 9.80 m/s^2 . This means that

a. it falls 9.80 m in the first second.

b. its downward velocity increases by 9.80 m/s each second.

c. its acceleration changes by 9.80 m/s^2 each second.

d. it travels exactly 9.80 m each second that it is falling.

12. A ball is allowed to fall freely from rest near Earth's surface. How far will the ball travel during the first 3.00 seconds of its drop? (See Figure 2.7 in the textbook.)

a. 4.90 m b. 9.80 m c. 19.6 m d. 44.1 m

13. The maximum range for a ball will be achieved when the ball is thrown at what angle with respect to level ground. (Neglect air friction.)

a. 30° b. 60° c. 45° d. 100°

14. When an object is in free-fall within a few thousand feet of Earth's surface and air resistance is neglected, its acceleration due to gravity will

- a. increase.**
- b. remain constant.**
- c. decrease.**
- d. be only 1/6 that of an object falling near the Moon's surface.**

Chapters: 10, 13

1. A quantity that is capable of producing motion is called

- a. a mass. b. a force. c. a slug. d. a newton**

2. One newton is defined as

- a. force between two 1-kilogram masses that are 1 meter apart.**
- b. force exerted by the Earth on a 1-kilogram mass.**
- c. force needed to accelerate a 1-kilogram mass at a rate of 1 m/s².**

- d. weight of 1 cubic meter of pure water.**
- 3. An unbalanced force always produces**
- a. a constant velocity.**
 - b. an acceleration.**
 - c. a state of equilibrium.**
 - d. circular motion.**
- 4. The inertia of a body is directly related to its**
- a. velocity. b. mass. c. volume. d. force.**
- 5. The law of motion stating that objects at rest will remain at rest and objects in motion will remain in motion in a straight line unless acted upon by some external force is known as**
- a. Newton's second law of motion.**
 - b. Newton's first law of motion.**
 - c. Newton's third law of motion.**
 - d. Newton's law of gravitation.**
- 6. The unit of force in the SI system is the**
- a. m/s. b. newton. c. meter. d. kilogram.**
- 7. The force of attraction between Earth and any object located on its surface is generally referred to as the object's**

a. inertia. b. mass. c. weight. d. momentum.

8. The equation for Newton's second law of motion can be rearranged in symbol notation to give

a. $F = m / a$ b. $a = F m$ c. $m = a / F$ d. $a = F / m$

9. When an object is free to move, a constant unbalanced force acting on it will produce

- a. a uniformly changing inertia.**
- b. a negative speed with respect to time.**
- c. a backward displacement.**
- d. a constant acceleration.**

10. Every mass in the universe attracts every other mass with a force that is

- a. inversely proportional to the magnitude of their masses.**
- b. directly proportional to the distance between their centers of mass.**
- c. directly proportional to the product of their masses.**
- d. inversely proportional to the linear distance between their centers of mass.**

11. Newton's third law of motion states that any mutual forces between two objects must be

- a. unequal in magnitude, and opposite in direction.**
- b. equal in magnitude, and in the same direction.**
- c. equal in magnitude, and opposite in direction.**
- d. unequal in magnitude, and in the same direction.**

12. The linear momentum of a body can be calculated by multiplying its mass by the

- a. time during which the mass moves.**
- b. acceleration of the mass.**
- c. distance the mass moves.**
- d. velocity of the mass.**

13. The momentum of an object

- a. is a scalar quantity.**
- b. can be calculated by taking the mass times the acceleration.**
- c. must have both magnitude and direction.**
- d. will not change even if a large unbalanced force is applied to the object.**

14. A change in momentum of an object means that

- a. the weight of the object is also changing.**
- b. the inertia of the object is changing.**
- c. the velocity of the object must also be changing.**
- d. the object must immediately come to a complete stop and remain at rest.**

15. A mass moves with an acceleration "a" when an unbalanced force is applied to it. If the mass is doubled but the unbalanced force is kept the same, what will happen to the acceleration?

- a. It will be reduced to $1/2$ a.**
- b. It will be exactly the same as before.**

- c. It will be doubled and now be equal to $2a$.
- d. It will stop the motion instantly.

16. A mass " m " moving with a velocity " v " has its velocity tripled. If the mass continues to travel along the same straight line, its new linear momentum will be

- a. equal to three times the original momentum.
- b. decreased to $1/3$ of the original momentum.
- c. changed in direction but not in magnitude.
- d. equal to nine times the original momentum.

17. The distance between the centers of two bowling balls at rest on the classroom lecture desk is 1 meter. The bowling balls are moved farther apart so that their centers are now 2 meters apart.

- a. The balls will each experience more gravitational pull by Earth.
- b. The balls will experience the same mutual gravitational attractive force as before.
- c. The balls will experience less mutual gravitational attractive force.

d. A repulsive gravitational force will now exist between the two balls.

18. An elevator that has a constant upward acceleration carries a man weighing 192 lb as a passenger. The floor of the elevator will exert a force on the man's feet that is

a. less than 192 lb.

b. exactly 192 lb.

c. zero pounds.

d. equal and opposite to the force exerted by the man's feet on the floor of the elevator.

19. The force that holds a satellite in orbit around Earth is caused by the gravitational pull of Earth. a. True b, False

20. A 2.0×10^3 kilogram car travels at a constant speed of 12 meters per second around a circular curve of radius 30. meters. What is the magnitude of the centripetal acceleration of the car as it goes around the curve?

a. 0.40 m/s^2

b. 4.8 m/s^2

c. 800 m/s^2

d. $9,600 \text{ m/s}^2$

20. How does surface roughness affect friction?

a. The tiny bumps make sliding motion more difficult

b. Roughness prevents any motion

c. Surface roughens causes molecular effects

21. If the force to slide one box on the floor is 10 pounds and you stack two other boxes of the same weight on top, what force is needed to slide them?

a. 10 pounds, because friction is independent of weight

b. 20 pounds, because you added two boxes

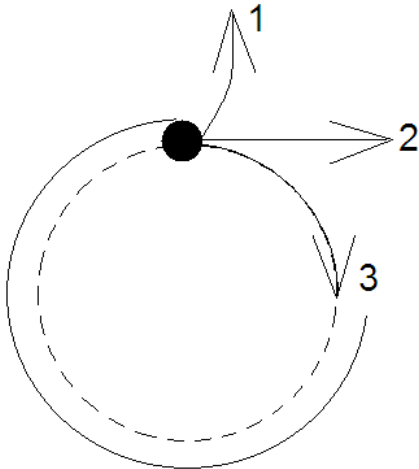
c. 30 pounds, because friction is proportional to weight

22. Which is greater: static or kinetic friction?

a. Static, because of additional friction forces

- b. Kinetic, because it is harder to keep the object moving
- c. They are the same, if the weight is the same

23. Mr. Tracy and Benny Kaplinski are taking some time off for a little putt-putt golf. The 15th hole at the Hole-In-One Putt-Putt Golf Course has a large metal rim which putters must use to guide their ball towards the hole. Benny Kaplinski guides a golf ball around the metal rim. When the ball leaves the rim, which path (1, 2, or 3)?



24. While driving down the road, Anna Litical observed a bug striking the windshield of her car. Quite obviously, a case of Newton's third law of motion. The bug hit the windshield and the windshield hit the bug. Which of the two forces is greater: the force on the bug or the force on the windshield?
- a. The force on the bug
 - b. The force on the windshield
 - c. The same
25. A gun recoils when it is fired. The recoil is the result of action-reaction force pairs. As the gases from the gunpowder explosion expand, the gun pushes the bullet forwards and the bullet pushes the gun backwards. The acceleration of the recoiling gun is...
- a. Greater than the acceleration of the bullet
 - b. Smaller than the acceleration of the bullet
 - c. The same size as the acceleration of the bullet
26. A ball is moving at 4 m/s and has a momentum of 48 kg•m/s. What is the ball's mass?
- a. 4 kg
 - b. 12 kg
 - c. 48 kg
 - d. 192 kg
 - e. none of these

- 27. An object with a zero acceleration always moves at the same speed.**
- a. True**
 - b. False**
- 28. An object with a positive acceleration will go faster and faster towards the right**
- a. True**
 - b. False**
- 29. If an object has an acceleration, the little arrows WILL NEVER be evenly spaced.**
- a. True**
 - b. False**