

**PHYS Chapter 9-10-11**

**95 terms by** [**Phi\_T\_Nguyen**](http://quizlet.com/Phi_T_Nguyen)



[Ready to study?  
Start with Flashcards](http://quizlet.com/30676289/flashcards)

**Study**

[ Flashcards](http://quizlet.com/30676289/flashcards)

[ Learn](http://quizlet.com/30676289/learn)

[ Speller](http://quizlet.com/30676289/speller)

[ Test](http://quizlet.com/30676289/test)

**Play**

[ Scatter](http://quizlet.com/30676289/scatter)

[ Space Race](https://quizlet.com/30676289/spacerace)

**Tools**

[ Copy](https://quizlet.com/30676289/recreate-set)

[ Add to Class](http://quizlet.com/30676289/phys-chapter-9-10-11-flash-cards/)

[ Add to Folder](http://quizlet.com/30676289/phys-chapter-9-10-11-flash-cards/)

[ Share](http://quizlet.com/30676289/phys-chapter-9-10-11-flash-cards/)

[ Print](http://quizlet.com/30676289/print)

[ More](http://quizlet.com/30676289/phys-chapter-9-10-11-flash-cards/)

* [List](http://quizlet.com/30676289/phys-chapter-9-10-11-flash-cards/)
* [Info](http://quizlet.com/30676289/info)

Advertisement [Upgrade to remove ads](https://quizlet.com/upgrade?source=ad)

Original Alphabetical

**A hoop of radius 1.0 m is placed in the first quadrant of an xy-coordinate system with its rim touching both  
the x-axis and the y-axis. What are the coordinates of its center of gravity?  
a. (1.0, 1.0) m   
c. (0.5, 0.5) m  
b. (0.7, 0.7) m   
d. Since there is nothing at the center of the hoop, it has no center of gravity.**

a. (1.0, 1.0) m

**If a net torque is applied to an object, that object will experience:  
a. a constant angular speed.   
c. a constant moment of inertia.  
b. an angular acceleration.   
d. an increasing moment of inertia.**

b. an angular acceleration.

**According to Newton's second law, the angular acceleration   
experienced by an object is directly proportional to:  
a. its moment of inertia.   
c. the object's size.  
b. the net applied torque.   
d. choices a and b above are both valid.**

b. the net applied torque.

**The Earth moves about the Sun in an elliptical orbit. As the Earth moves closer to the Sun, which of the following best describes the Earth-Sun system's moment of inertia?  
a. decreases   
c. remains constant  
b. increases   
d. none of the above choices are valid**

a. decreases

**9. A figure skater with arms initially extended starts spinning on the ice at 3 rad/s. She then pulls her arms in close to her body. Which of the following results?  
a. a smaller rotational rate   
c. a greater angular momentum  
b. a greater rotational rate   
d. a smaller angular momentum**

b. a greater rotational rate

**Two spheres, one with the center core up to r = R/2 hollow and the other solid, have the same mass M and same outer radius R. If they are both rolling at the same linear speed, which one has the greater kinetic energy?  
a. The both have the same kinetic energy.  
c. The solid one has the greater kinetic energy.  
b. The hollow one has the greater kinetic energy.  
d. More information is needed to choose an answer.**

b. The hollow one has the greater kinetic energy.

**A person sits on a freely spinning lab stool (no friction). When this person extends her arms,  
A) her moment of inertia decreases and her angular velocity increases.  
B) her moment of inertia decreases and her angular velocity decreases.  
C) her moment of inertia increases and her angular velocity increases.  
D) her moment of inertia increases and her angular velocity decreases.**

D) her moment of inertia increases and her angular velocity decreases.

**An ice skater doing a spin pulls in her arms, decreasing her moment of inertia by a factor of two. How  
does her angular speed changes?  
A) It is reduced by a factor of two.  
B) It is reduced by a factor of four.  
C) It increases by a factor of two.  
D) It increases by a factor of four.**

C) It increases by a factor of two.

**What is the correct expression for torque, in terms of the magnitude of the force, F, the radial distance  
from the axis of rotation, r, and the angle between the force and the radial line, θ ?  
A) τ = F r sinθ  
B) τ = F r cosθ  
C) τ = F r tanθ  
D) τ = F r θ**

A) τ = F r sinθ

**Consider a hoop of radius R and mass M rolling without slipping. Which form of kinetic energy is  
larger, translational or rotational?  
A) Translational kinetic energy is larger.  
B) Rotational kinetic energy is larger.  
C) Both are equal.  
D) You need to know the speed of the hoop to tell.**

C) Both are equal.

**Two balls, one of radius R and mass M, the other of radius 2R and mass 8M, roll down an incline. They  
start together from rest at the top of the incline. Which one will reach the bottom of the incline first?  
A) The small sphere  
B) Both reach the bottom together.  
C) The large sphere  
D) It depends on the height of the incline.**

B) Both reach the bottom together.

**Two children are riding on a merry-go-round. Child A is at a greater distance from the axis of  
rotation than child B. Which child has the larger linear displacement?  
5)  
A) Child A  
B) Child B  
C) They have the same zero linear displacement.  
D) They have the same non-zero linear displacement.  
E) There is not enough information given to answer the question.**

A) Child A

**Two children are riding on a merry-go-round. Child A is at a greater distance from the axis of  
rotation than child B. Which child has the larger tangential acceleration?  
6)  
A) Child A  
B) Child B  
C) They have the same non-zero centripetal acceleration.  
D) They have the same zero centripetal acceleration.  
E) There is not enough information given to answer the question.**

A) Child A

**A solid cylinder is rolling without slipping. What fraction of its kinetic energy is rotational?   
A) 2/3   
B) 3/4   
C) 1/4   
D) 1/3  
E) 1/2**

D) 1/3

**A disk, a hoop, and a solid sphere are released at the same time at the top of an inclined plane.  
They all roll without slipping. In what order do they reach the bottom?  
9)  
A) hoop, sphere, disk  
B) sphere, disk, hoop  
C) hoop, sphere, disk  
D) disk, hoop, sphere  
E) hoop, disk, sphere**

B) sphere, disk, hoop

**Angular momentum cannot be conserved if 22)  
A) the moment of inertia changes.  
B) the net torque is not zero.  
C) the angular acceleration changes.  
D) the angular velocity changes.  
E) there is a net force on the system.**

B) the net torque is not zero.

**When you ride a bicycle, in what direction is the angular velocity of the wheels? 29)  
A) to your right  
B) forwards  
C) up  
D) backwards  
E) to your left**

E) to your left

**Two equal forces are applied to a door. The first force is applied at the midpoint of the door; the  
second force is applied at the doorknob. Both forces are applied perpendicular to the door. Which  
force exerts the greater torque?  
A) both exert equal non-zero torques  
B) the second at the doorknob  
C) the first at the midpoint  
D) both exert zero torques  
E) Additional information is needed.**

B) the second at the doorknob

**A mass is attached to a vertical spring and bobs up and down between points A and B. Where is  
the mass located when its kinetic energy is a maximum?  
A) midway between A and B  
B) one-third of the way between A and B  
C) one-fourth of the way between A and B  
D) at either A or B  
E) none of the above**

A) midway between A and B

**A railroad car of mass m and speed v collides and sticks to an identical railroad car that is initially at rest.  
After the collision, the kinetic energy of the system  
A) is the same as before.   
B) is one quarter as much as before.  
C) is half as much as before.   
D) is one third as much as before.**

C) is half as much as before.

**Two strings are made of the same material. String 1 has radius r1 while string 2 has radius r2 = r1/2. When stretched by the same tension, the respective speed of propagation of waves v1 and v2  
satisfy the condition  
A) v1 =v2/ 2.  
B) v1 = 2v2.  
C) v1 = v2/4.  
D) v1 = 2v2.  
E) v1 = v2/2.**

E) v1 = v2/2.

**A mass is attached to a spring and oscillates with a period T. If the mass is doubled, what is the new period?  
34)  
A) T sqr(2)   
B) 2T   
C) T/ 2   
D) T/2   
E) T**

A) T sqr(2)

**The gravitational force between two objects is inversely proportional to  
A) the square of the distance between the two objects.  
B) the product of the masses of the two objects.  
C) the square of the product of the masses of the two objects.  
D) the distance between the two objects.  
E) none of the above**

A) the square of the distance between the two objects.

**Two equal forces are applied to a door at the doorknob. The first force is applied perpendicular to the door; the second force is applied at 30° to the plane of the door. Which  
force exerts the greater torque?  
A) both exert equal non-zero torques  
B) the second applied at an angle  
C) both exert zero torques  
D) the first applied perpendicular to the door  
E) Additional information is needed.**

D) the first applied perpendicular to the door

**Because Earthʹs orbit is slightly elliptical, Earth actually gets closer to the Sun during part of the year. When Earth is closer to the Sun its  
orbital speed is  
A) sometimes greater sometimes smaller  
than when Earth is farthest away from the Sun.  
B) the same as when Earth is farthest away  
from the Sun.  
C) less than when Earth is farthest away from the Sun.  
D) greater than when Earth is farthest away from the Sun.**

D) greater than when Earth is farthest away from the Sun.

**Two objects attract each other gravitationally. If the distance between their centers is cut in half, the gravitational force  
A) doubles.  
B) is cut in half.  
C) quadruples  
D) is cut to one fourth**

D) is cut to one fourth

**A mass oscillates on the end of a spring, both on Earth and on the Moon. Where is the period the greatest?  
A) the Moon  
B) Earth  
C) the same on both Earth and the Moon  
D) Cannot be determined from the  
information given.**

C) the same on both Earth and the Moon

**36) If you take a given pendulum to the Moon, where the acceleration of gravity is less than on Earth, the resonant frequency of the  
pendulum will  
A) become zero.  
B) increase.  
C) decrease.  
D) not change.  
E) either increase or decrease; it depends on its length to mass ratio.**

C) decrease.

**What is the ratio of potential energy to kinetic energy for a comet that has just enough energy to escape  
from the Sun's gravitational field?  
A) 1/2  
B) 1  
C) 2  
D) -1**

D) -1

**Kepler's second law tells us that planets sweep out equal areas in equal times. If you compare the  
amount of area per time swept by Earth with the one of Jupiter, you would conclude:  
A) They sweep the same area per time.  
B) They sweep different areas per time.  
C) Jupiter sweeps a larger area per time because it has much more mass than Earth.  
D) Earth sweeps a larger area per time because it has much less mass than Jupiter.**

B) They sweep different areas per time.

**Two bodies, one of mass M and the other of mass m, are subject only to their mutual gravitational  
attraction. One possible motion is for both of them to revolve in concentric circles about their center of mass. What is the connection between the period of the revolutions and the separation R between the two bodies in this case?  
A) 2πR3/2/[G(M + m)]1/2  
B) 2πR3/2(M + m)1/2/(GMm)1/2  
C) 2πR3/2(M + m)1/2/[G(M2 + m2)]1/2  
D) 2πR3/2(M + m)/(G)1/2(Mm)3/4**

A) 2πR3/2/[G(M + m)]1/2

**Two identical spheres, each of mass M and radius R just touch each other. What is the   
magnitude of the gravitational force that they exert on each other?   
  
a. (GM2)/(R2).   
b. (GM2)/(2R2).  
c. (GM2)/(4R2).   
d. (2GM2)/(R2).**

c. (GM2)/(4R2).

**A satellite completes one full orbit around Earth. The work performed by Earth's gravitational force on the satellite is  
A) always positive.  
B) zero J.  
C) always negative.  
D) positive most of the time.  
E) negative most of the time.**

B) zero J.

**A dumbbell-shaped object is composed by two equal masses, m, connected by a rod of negligible mass and length r. If I1 is the moment of inertia of this object with respect to an axis passing through the center of the rod and perpendicular to it and I2 is the moment of inertia with respect to an axis passing through one of the masses we can say that   
A) I1 = I2.   
B) I1 > I2.   
C) I1 < I2.   
D) There is no way to compare I1 and I2**

C) I1 < I2.

**A figure skater is spinning slowly with arms outstretched. She brings her arms in close to her body and her angular speed increases dramatically. The speed increase is a demonstration of  
A) conservation of energy: her moment of inertia is decreased, and so her angular speed must increase to conserve energy.  
B) conservation of angular momentum: her moment of inertia is decreased, and so her angular speed must increase to conserve angular momentum.  
C) Newton's second law for rotational motion: she exerts a torque and so her angular speed increases.  
D) This has nothing to do with mechanics, it is simply a result of her natural ability to perform.**

B) conservation of angular momentum: her moment of inertia is decreased, and so her angular speed must increase to conserve angular momentum

**Two forces are applied to a doorknob, perpendicular to the door. The first force is twice as large as the second force. The ratio of the torque of the first to the torque of the second is  
A) 1/2.   
B) 1/4.   
C) 4.   
D) 2.**

D) 2.

**Two different masses have equal, non-zero kinetic energies. The momentum of the smaller mass is  
A) smaller than the momentum of the larger mass.  
B) larger than momentum of the larger mass.  
C) equal to the momentum of the larger mass.  
D) There is not enough information to answer the question.**

A) smaller than the momentum of the larger mass.

**An ice skater doing a spin pulls in her arms, decreasing her moment of inertia by a factor of two, and  
doubling her angular speed. Her final rotational kinetic energy  
A) remains unchanged.  
B) is cut in half.  
C) quadruples.  
D) is doubled.**

D) is doubled.

**A croquet mallet balances when suspended from its center of mass, as shown in the figure (left). If you  
cut the mallet in two at its center of mass, as shown, how do the masses of the two pieces compare?  
A) The masses are equal.  
B) The piece with the head of the mallet has the greater mass.  
C) The piece with the head of the mallet has the smaller mass.  
D) It is impossible to tell.**

B) The piece with the head of the mallet has the greater mass

**Two children ride on a merry-go-round, George is at a greater distance from the axis of rotation than  
Jacques. It is a true statement that  
A) Jacques has a greater speed than George.  
B) Jacques and George have the same speed.  
C) Jacques has a smaller speed than George.  
D) Cannot tell which one has the greater speed without knowing their masses.**

C) Jacques has a smaller speed than George.

**A solid sphere and a cylinder of the same mass and radius roll without slipping at the same speed. It is  
correct to say that the total kinetic energy of the solid sphere is  
A) more than the total kinetic energy of the cylinder.  
B) less than the total kinetic energy of the cylinder.  
C) equal to the total kinetic energy of the cylinder.  
D) impossible to compare to the total kinetic energy of the cylinder**

B) less than the total kinetic energy of the cylinder.

**In a collision between two unequal masses, how does the impulse imparted to the smaller mass by the  
larger mass compare with the impulse imparted to the larger mass by the smaller one?  
A) It is larger.  
B) It is smaller.  
C) They are equal.  
D) The answer depends on how fast they are moving.**

C) They are equal.

**person sits on a freely spinning lab stool (no friction). When this person extends her arms,  
A) her moment of inertia decreases and her angular velocity increases.  
B) her moment of inertia decreases and her angular velocity decreases.  
C) her moment of inertia increases and her angular velocity increases.  
D) her moment of inertia increases and her angular velocity decreases**

D) her moment of inertia increases and her angular velocity decreases

**You are holding a finishing sander with your right hand. The sander has a flywheel which spins counterclockwise as seen from behind the handle. You are sanding a wall in front of you. As you turn the  
sander towards the right, you feel a tendency in the sander to  
A) turn upward.  
B) turn downward.  
C) push toward you.  
D) pull away from you.**

B) turn downward.

**You are walking holding on to the axle of a spinning bicycle wheel with one hand on either side of the wheel. The top part of the wheel is moving away from you and the bottom is moving toward you and the axle is horizontal. As you start to turn left, you feel the right side of the axle  
A) push on your right hand toward you.  
B) pull on your right hand away from you.  
C) push on your right hand vertically up.  
D) push on your right hand vertically down**

D) push on your right hand vertically down

**Consider a sphere of radius R and mass M rolling without slipping. Which form of kinetic energy is  
larger, translational or rotational?  
A) Translational kinetic energy is larger.  
B) Rotational kinetic energy is larger.  
C) Both are equal.  
D) You need to know the speed of the sphere to tell.**

A) Translational kinetic energy is larger

**As you are leaving a building, the door opens outward. If the hinges on the door are on your right, what  
is the direction of the angular velocity of the door as you open it?  
A) up  
B) down  
C) to your left  
D) to your right**

B) down

**Which one of the following statements is true?  
A. the center of mass of an object must lie within the object  
B. all the mass of an object is actually concentrated at its center of mass  
C. the center of mass of an object cannot move if there is zero net force on the object  
D. the center of mass of a cylinder must lie on its axis  
E. none of the above**

E. none of the above

**The center of mass of a uniform disk of radius R is located:  
A. on the rim  
B. a distance R/2 from the center  
C. a distance R/3 from the center  
D. a distance 2R/3 from the center  
E. at the center**

E. at the center

**The center of mass of the system consisting of Earth, the Sun, and the planet Mars is:  
A. closer to Earth than to either of the other bodies  
B. closer to the Sun than to either of the other bodies  
C. closer to Mars than to either of the other bodies  
D. at the geometric center of the triangle formed by the three bodies  
E. at the center of the line joining Earth and Mars**

B. closer to the Sun than to either of the other bodies

**The center of mass of Earth's atmosphere is:  
A. a little less than halfway between Earth's surface and the outer boundary of the atmosphere  
B. near the surface of Earth  
C. near the outer boundary of the atmosphere  
D. near the center of Earth  
E. none of the above**

D. near the center of Earth

**The center of mass of a system of particles obeys an equation similar to Newton's second law  
F= macom, where:  
A. 􀁮 F is the net internal force and m is the total mass of the system  
B. 􀁮 F is the net internal force and m is the mass acting on the system  
C. 􀁮 F is the net external force and m is the total mass of the system  
D. 􀁮 F is the force of gravity and m is the mass of Earth  
E. 􀁮 F is the force of gravity and m is the total mass of the system**

C. 􀁮 F is the net external force and m is the total mass of the system

**The center of mass of a system of particles has a constant velocity if:  
A. the forces exerted by the particles on each other sum to zero  
B. the external forces acting on particles of the system sum to zero  
C. the velocity of the center of mass is initially zero  
D. the particles are distributed symmetrically around the center of mass  
E. the center of mass is at the geometric center of the system**

B. the external forces acting on particles of the system sum to zero

**The center of mass of a system of particles remains at the same place if:  
A. it is initially at rest and the external forces sum to zero  
B. it is initially at rest and the internal forces sum to zero  
C. the sum of the external forces is less than the maximum force of static friction  
D. no friction acts internally  
E. none of the above**

A. it is initially at rest and the external forces sum to zero

**A man sits in the back of a canoe in still water. He then moves to the front of the canoe and  
sits there. Afterwards the canoe:  
A. is forward of its original position and moving forward  
B. is forward of its original position and moving backward  
C. is rearward of its original position and moving forward  
D. is rearward of its original position and moving backward  
E. is rearward of its original position and not moving**

E. is rearward of its original position and not moving

**Two bodies of unequal mass, placed at rest on a frictionless surface, are acted on by equal  
horizontal forces for equal times. Just after these forces are removed, the body of greater mass  
will have:  
A. the greater speed  
B. the greater acceleration  
C. the smaller momentum  
D. the greater momentum  
E. the same momentum as the other body**

E. the same momentum as the other body

**Consider a plot of the displacement (x) vs. applied force (F) for an ideal elastic spring. The slope of  
the curve would be  
43)  
A) the reciprocal of the acceleration of gravity.  
B) the reciprocal of the spring constant.  
C) the reciprocal of the displacement.  
D) the spring constant.  
E) the acceleration of gravity.**

B) the reciprocal of the spring constant.

**An object that is initially at rest breaks up into two pieces of unequal masses when a  
spring-loaded device is released. If you compare the kinetic energy of the larger mass to that of the  
smaller mass immediately after they separate, which of the following statements is correct?  
72)  
A) The kinetic energies of the two masses are equal.  
B) The kinetic energy of the smaller mass is greater.  
C) The total kinetic energy is zero J.  
D) The kinetic energy of the larger mass is greater.**

B) The kinetic energy of the smaller mass is greater.

**A rope is lying on a table. You pick up one end and start raising it with a constant velocity. The  
force you have to exert on the rope is  
73)  
A) greater than the weight of the portion of the rope that is not on the table.  
B) zero N.  
C) less than the weight of the portion of the rope that is not on the table but not zero N.  
D) equal to the weight of the portion of the rope that is not on the table.  
E) Cannot be determined without additional information.**

A) greater than the weight of the portion of the rope that is not on the table.

**An elastic collision of two objects is characterized by the following. 74)  
A) Total kinetic energy of the system remains constant.  
B) Total momentum of the system is conserved.  
C) Both A and B are true.  
D) Neither A nor B are true.**

C) Both A and B are true.

**When a baseball bat hits the ball, the impulse delivered to the ball is increased by  
A. "follow through" on the swing.  
B. rapidly stopping the bat after impact.  
C. letting the bat recoil upon impact.  
D. impulse cannot be changed.**

A. "follow through" on the swing.

**One form of the proper metric unit for momentum is  
A. Nt·sec.  
B. Kg·m.  
C. Kg·m/s2.  
D. Joule.**

A. Nt·sec.

**Suppose you are out on a frozen lake, where there is no friction. Which of the following  
would start you moving towards the shore?  
A. Shouting at someone on the shore.  
B. Removing a shoe and throwing it towards the shore.  
C. Removing a shoe and throwing it away from the shore.  
D. None of these would work.**

C. Removing a shoe and throwing it away from the shore.

**A gun is made of a super-low weight but strong material. The bullet for the gun is more massive than the gun itself. For such a gun  
A. recoil problems would be lessened.  
B. the gun, if unsupported, would have a recoil velocity higher than the bullet velocity.  
C. conservation of momentum is not satisfied.  
D. the bullet would go faster with less powder.**

B. the gun, if unsupported, would have a recoil velocity higher than the bullet velocity.

**The purpose of an air bag in an auto is to  
A. reduce your speed just before a collision.  
B. increase the force applied to you during a collision.  
C. increase your body's stopping time during a collision.  
D. reduce the need for good brakes on your car.**

C. increase your body's stopping time during a collision.

**bowling ball, moving to the east at a speed of 1.4 m/s, collides head-on with a stationary beach ball of the same diameter but less than one twentieth the mass. After the collision, the beach ball moves with a speed of 1.6 m/s. Which of the following is then true?  
A. The bowling ball has a velocity of slightly under 1.4 m/s, to the east.  
B. The beach ball has more momentum than the bowling ball.  
C. The bowling ball recoils to the west with nearly the same speed as before the collision.  
D. The bowling ball and the beach ball have the same momentum after the collision.**

A. The bowling ball has a velocity of slightly under 1.4 m/s, to the east

**Which of the following mathematical expressions should be used to calculate the momentum  
of an auto?  
A. weight × speed  
B. mass × acceleration  
C. mass × velocity  
D. weight × force**

C. mass × velocity

**The momentum of a truck is increased by a factor of 4; its weight does not change. Thus,  
A. its acceleration is doubled.  
B. its speed increased by a factor of 4.  
C. its speed doubled.  
D. its kinetic energy doubled.**

B. its speed increased by a factor of 4.

**A quantity which is conserved in the collision of a car and a truck is  
A. kinetic energy.  
B. nervous energy.  
C. momentum of the car.  
D. total momentum.  
E. momentum of the truck.**

D. total momentum.

**A ping-pong ball is dropped vertically, onto a stationary bowling ball resting on the floor. Which of the balls experiences the greater force as a result of the collision?  
A. Neither, both experience forces of the same size.  
B. The ping-pong ball.  
C. The bowling ball.  
D. It's impossible to tell from this data.**

A. Neither, both experience forces of the same size.

**A tennis ball bounces off a brick wall. Which of the following is true?  
A. The total momentum of the ball, wall, and earth is conserved in this process.  
B. The momentum of the ball is conserved in this process.  
C. If the collision is elastic, then the ball's velocity does not change in this process.  
D. None of these is true.**

A. The total momentum of the ball, wall, and earth is conserved in this process.

**12. Object A moving due east collides with object B moving due west. After the collision, A is moving 20° north of due east. What must be true of B after the collision?  
A. B must be moving 20° south of due east.  
B. B must be moving 20° south of due west.  
C. At least part of B's velocity must be toward the west.  
D. At least part of B's velocity must be toward the south.  
E. None of these.**

E. None of these.

**Force F, acting for time T and over a distance D, gives impulse I. To get the same impulse using half the force, it would be necessary for the force to act  
A. over a distance 2D.  
B. over a distance 4D.  
C. over half the distance D.  
D. for a time 2T.  
E. for half the time T.**

D. for a time 2T.

**The principle that total momentum does not change during a brief collision is a result of  
A. the definition of the kilogram.  
B. the definition of the newton.  
C. Newton's first law and Newton's second law.  
D. Newton's first law and Newton's third law.  
E. Newton's second law and Newton's third law.**

E. Newton's second law and Newton's third law.

**A box is pushed eastward across a rough horizontal floor by a force acting parallel to the floor. A force providing an impulse directed westward on the body is  
A. gravity.  
B. friction.  
C. the applied force.  
D. normal reaction force of floor upward on body.  
E. a fictitious force.**

B. friction.

**A box is pushed across a rough horizontal floor by a force acting parallel to the floor in the direction of motion. A force providing no impulse during the motion is  
A. gravity.  
B. friction.  
C. the applied force.  
D. None of these.**

D. None of these.

**Which of these collisions is likely to be most nearly elastic?  
A. Two steel balls collide at high speed.  
B. Two steel balls collide at low speed.  
C. A steel ball collides with a cotton ball at low speed.  
D. A steel ball collides with a cotton ball at high speed**

B. Two steel balls collide at low speed.

**If the speed of a car is doubled, the impulse required to stop the car changes by a factor of  
A. 4.  
B. 2.  
C. 1.  
D. ½.  
E. ¼**

B. 2.

**During a collision, which of these is an indication that the total kinetic energy has changed?  
A. Heat is generated.  
B. Deformation occurs.  
C. Sound is produced.  
D. All of A, B, and C.  
E. None of these.**

D. All of A, B, and C.

**33. During a collision, which of these is an indication that the total momentum has changed?  
A. Heat is generated.  
B. Deformation occurs.  
C. Sound is produced.  
D. All of A, B, and C.  
E. None of these**

E. None of these

**Suppose a ball is dropped from shoulder height, falls, makes a perfectly elastic collision with the floor, and rebounds to shoulder height. Compare the magnitudes of the impulses delivered to  
the ball by gravity and by the floor during this entire motion.  
A. The two impulses have the same magnitude.  
B. The impulse delivered by the floor is twice as large as the impulse delivered by gravity.  
C. The impulse delivered by the floor is half as large as the impulse delivered by gravity.  
D. The floor delivers an upward impulse, but gravity does not deliver a total impulse.**

A. The two impulses have the same magnitude.

**Although Newton's second law, F = ma, is valid for collisions, it cannot generally be used in this form for collisions because  
A. the acceleration a is too small.  
B. the force F is not constant.  
C. the acceleration a occurs during a time interval too short to measure easily.  
D. both A and B.  
E. both B and C.**

E. both B and C

**ball at the end of a string is twirled at constant speed in a horizontal circle. The magnitude of the total impulse delivered to the ball by the tension in the string  
A. is zero for any number of complete round trips.  
B. is twice as high for one full round trip as it is for one half of a round trip.  
C. is not zero for a round trip, since the string supports the weight of the ball.  
D. is always directed toward the center of the circle.**

C. is not zero for a round trip, since the string supports the weight of the ball.

**Suppose two boys are trapped on the ice atop a frozen pond, and that the ice is completely  
frictionless. The boys are initially at rest, but they do have a baseball. They begin to play catch  
with the ball. Which of these is true?  
A. This will not help the boys get to shore.  
B. They will get to shore more quickly if they hold hands.  
C. If the first boy to catch the ball doesn't throw it back, both will reach shore more quickly.  
D. Each boy will speed up as he throws the ball, and slow down as he catches it.  
E. If at least one catch is made, both should make it to shore.**

E. If at least one catch is made, both should make it to shore.

**A bullet is fired into a wall and comes to rest. Considering the bullet as the system we can  
say that  
A. the total kinetic energy is conserved.  
B. the momentum is conserved.  
C. both total kinetic energy and momentum are conserved.  
D. neither total kinetic energy nor momentum are conserved.**

D. neither total kinetic energy nor momentum are conserved.

**plane. Which object reaches the bottom of the incline first?  
A) The hoop  
B) The disk  
C) Both reach the bottom at the same time.  
D) It depends on the angle of inclination**

B) The disk

**An artillery shell explodes in midair and breaks up into many fragments. Which of the following statements are true regarding conditions immediately before and immediately after the explosion:  
I. The total momentum of the fragments is equal to the original momentum of the shell.  
II. The total kinetic energy of the fragments is equal to the original kinetic energy of the shell.  
A) Statement I only  
B) Statement II only  
C) Both Statement I and Statement II  
D) Neither statement is true.**

A) Statement I only

**A tennis ball undergoes an elastic collision when it hits the ground and bounces up. It is given that the  
speed of the ball just before it hits the ground is -v0 and immediately after rebounding it is +v0. Which of  
the statements below is true?  
A) The momentum of the ball changes but the momentum of Earth does not.  
B) The momentum of the ball changes and the momentum of Earth also changes.  
C) The momentum of the ball does not change but the momentum of Earth changes.  
D) Neither the momentum of the ball nor the momentum of Earth changes.**

B) The momentum of the ball changes and the momentum of Earth also changes.

**You are standing at a bus stop holding an umbrella on a rainy day. While you wait for the bus the rain  
shower turns into hail. Compared to the rain, the number of hail "drops" hitting the umbrella per second,  
the mass of the "drops", and their speed all remain the same. The force you must exert to hold the umbrella in the hail is  
A) less than the force required in the rain.  
B) the same as the force required in the rain.  
C) more than the force required in the rain.  
D) impossible to compare with the force required in the rain.**

C) more than the force required in the rain.

**A 3.0-kg object moves to the right at 4.0 m/s. It collides head-on with a 6.0-kg object moving to the left at 2.0 m/s. Which statement is correct?  
A) The total momentum before the collision is 0 kg · m/s, and after the collision is 24 kg · m/s.  
B) The total momentum both before and after the collision is 24 kg · m/s.  
C) The total momentum both before and after the collision is zero.  
D) The total momentum before the collision is 24 kg · m/s, and after the collision is 0 kg · m/s.  
E) None of the above is true.**

C) The total momentum both before and after the collision is zero.

**In attempting to pull a 1500-kg car out of a ditch, Al exerts a force of 200 N for 5 s, Bill exerts a force of 500 N for two s, and Clyde exerts a force of 300 N for four seconds. The car does not move at all. Who provided the greatest impulse?  
A. Al  
B. Bill  
C. Clyde  
D. Al, Bill, and Clyde provide equal, indeed zero, impulse.**

C. Clyde

**A car is traveling along a highway at 65 mph. What is the linear speed of the bottom of the tires?  
A) 130 mph  
B) 0 mph  
C) 3.0 mph  
D) 130. mph**

B) 0 mph

**Identical forces act for the same length of time on two different masses. The change in momentum of the smaller mass is  
Answer  
  
zero.  
  
larger than the change in momentum of the larger mass.  
  
smaller than the change in momentum of the larger mass, but not zero.  
  
equal to the change in momentum of the larger mass.  
  
There is not enough information to answer the question.**

equal to the change in momentum of the larger mass.

**An inelastic collision of two objects is characterized by the following.  
A) Total momentum of the system is conserved.  
B) Total kinetic energy of the system remains constant.  
C) Both A and B are true.  
D) Neither A nor B are true.**

A) Total momentum of the system is conserved.

**Two children are riding on a merry-go-round. Child A is at a greater distance from the axis of rotation than  
child B. Which child has the larger angular speed?  
A) Child A  
B) Child B  
C) They have the same angular speed.  
D) There is not enough information given to answer the question**

C) They have the same angular speed.

**Please allow access to your computer’s microphone to use Voice Recording.**

Having trouble? [Click here](http://quizlet.com/help/faq-why-cant-i-click-the-flash-player-allow-button) for help.



* Using Quizlet
* [Sign Up](https://quizlet.com/sign-up)
* [Help](http://quizlet.com/help)
* [Mobile](http://quizlet.com/mobile)
* [Students](http://quizlet.com/students)
* [Teachers](http://quizlet.com/teachers)
* About Quizlet
* [Company](http://quizlet.com/about)
* [Jobs](http://quizlet.com/jobs)
* [Privacy](http://quizlet.com/privacy)
* [Terms](http://quizlet.com/tos)
* [Contact](http://quizlet.com/feedback)

Study Everywhere! © 2014 Quizlet LLC. Follow [@quizlet](https://twitter.com/quizlet) on Twitter.