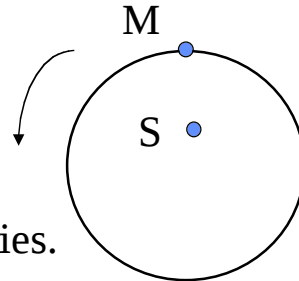


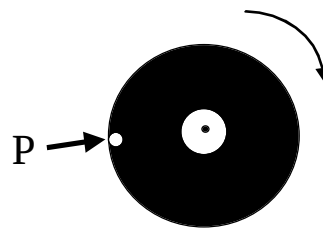
Chapter 8

Steve (S) and his brother Mark (M) are riding on a merry-go-round as shown.



- A) They have the same speed, but different angular velocities.
- B) They have the same speed, and the same angular velocities
- C) They have different speeds and different angular velocities.
- D) They have different speeds and the same angular velocity

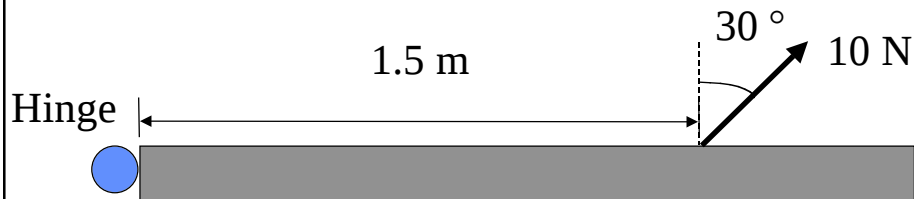
The record playing on the turntable is rotating clockwise as seen from above. After turning it off, the turntable is slowing down, but hasn't stopped yet. The direction of the acceleration at point P is



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

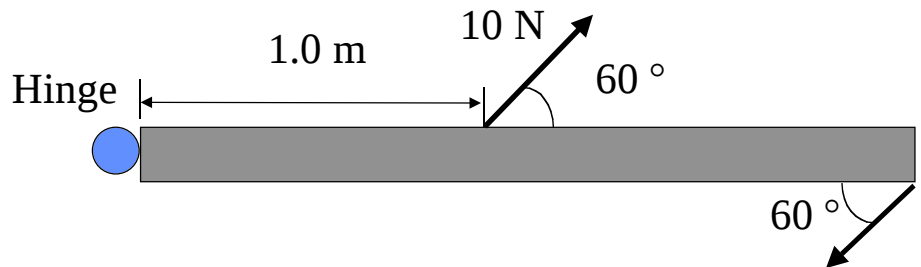
Chapter 8

The diagram shows a door that is 2 m wide. A force of 10 N is applied at the point shown. What is the magnitude of the torque on the door with respect to the hinge?



- A) zero
- B) 13 N·m
- C) 7.5 N·m
- D) 10 N·m
- E) 17 N·m

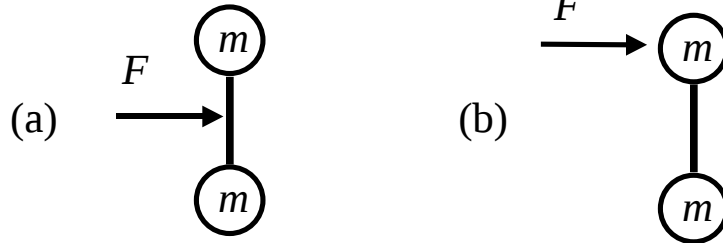
The diagram show the top view of a door that is 2 m wide. Two force are applied to the door as indicated in the diagram. What is the magnitude of the net torque on the door with respect to the hinge?



- A) zero
- B) 10.0 N·m
- C) 4.0 N·m
- D) 26.0 N·m
- E) 8.7 N·m

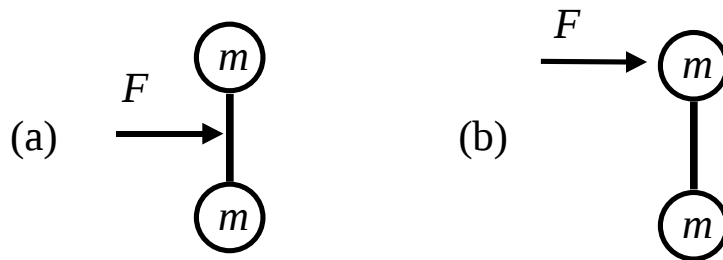
Chapter 8

A force F is applied to a dumbbell for a time interval Δt , first as in (a) and then as in (b). In which case does the dumbbell acquire the greater center-of-mass speed?



- A) (a)
- B) (b)
- C) no difference

A force F is applied to a dumbbell for a time interval Δt , first as in (a) and then as in (b). In which case does the dumbbell acquire the greater energy?



- A) (a)
- B) (b)
- C) no difference

Chapter 8

A hollow cylinder of mass M and radius R rolls down an inclined plane. A block of mass M slides down an identical inclined plane. If both objects are released at the same time

- A) the block will reach the bottom first.
- B) the cylinder will reach the bottom first.
- C) the block will reach the bottom with greater kinetic energy
- D) the cylinder will reach the bottom with greater kinetic energy
- E) both the block and the cylinder will reach the bottom at the same time.

A solid sphere (S), a thin hoop (H), and a solid disk (D), all with the same radius, are allowed to roll down an inclined plane without slipping. In which order will they arrive at the bottom? (The first one down listed first).

- A) H,D,S
- B) H,S,D
- C) S,D,H
- D) S,H,D
- E) D,H,S

Chapter 8

In what circumstances can the angular velocity of a system of particles change without any change in the system's angular momentum?

- A) This cannot happen under any circumstances.
- B) This can happen if a net external force acts on the center of mass.
- C) This can happen if the only forces acting are internal to the system.
- D) This can happen if an external net torque is applied properly to the system.
- E) This can happen if there are only conservative forces acting on the system.

An ice skater performs a pirouette by pulling her outstretched arms close to her body. What happens to her moment of inertia about the axis of rotation?

- A) It does not change.
- B) It increases.
- C) It decreases.
- D) It changes, but it is impossible to tell which way.

Chapter 8

An ice skater performs a pirouette by pulling her outstretched arms close to her body. What happens to her angular momentum about the axis of rotation?

- A) It does not change.
- B) It increases.
- C) It decreases.
- D) It changes, but it is impossible to tell which way.

A ball on a string is rotating in a circle. The string is shortened by pulling it through the axis of rotation. What happens to the angular velocity and the tangential velocity of the ball?

angular velocity

tangential velocity

- | | |
|-------------------|----------------|
| A) increases | decreases |
| B) increases | stays the same |
| C) increases | increases |
| D) stays the same | stays the same |
| E) stays the same | increases |

Chapter 8

An ice skater performs a pirouette by pulling her outstretched arms close to her body. What happens to her rotational kinetic energy about the axis of rotation?

- A) It does not change.
- B) It increases.
- C) It decreases.
- D) It changes, but it is impossible to tell which way.