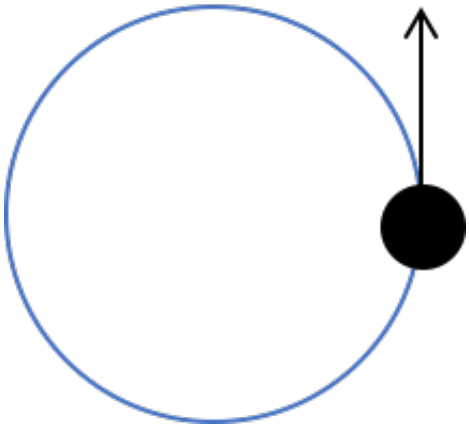
Question 1 (2 points)

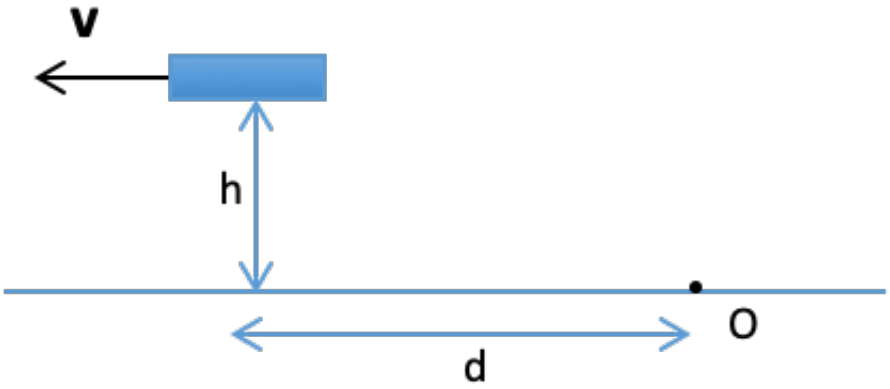
A ball of mass m moves in a uniform circle of radius R with speed v as shown. What is the angular momentum during the whole circular motion, relative to the center of the circle?



- a) mvR out of the page
- b) mvR into the page
- c) mvR^2 out of the page
- d) mvR^2 into the page

Question 2 (2 points)

A plane of mass m and speed v flies a height h above level ground to the left as shown. What is the angular momentum of the plane relative to point O at the moment that it is a horizontal distance d from point O?



- a) mvd, out of the page
- b) 0 (there is no angular momentum, only linear momentum)
- c) mvh, out of the page
- d) mvh, into the page
- e) $mv\sqrt{h^2 + d^2}$, out of the page

Question 3 (2 points)

What are the units of angular momentum?

a) $kg\frac{m^2}{s^2}$

b) $kg\frac{m}{s}$

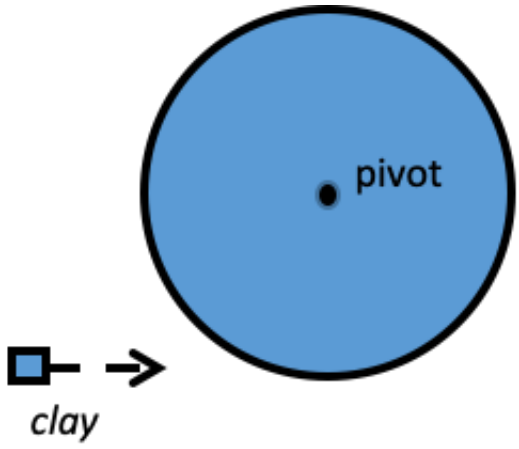
c) $\frac{kg}{m}$

d) $kg\ m^2$

e) $kg\frac{m^2}{s}$

Question 4 (2 points)

A wheel is pivoted at its center. It has a radius R. A piece of clay of mass m and speed v is about to strike it at the bottom edge, tangentially, as shown. What is the angular momentum of the clay relative to the pivot?



- a) Not enough information
- b) mv
- c) 0
- d) $\frac{mv}{R}$
- e) None of these

Question 5 (2 points)

A toy bike rides along a table in a straight line. Imagine that is rolls from the bottom towards the top of a piece of paper. We will call that direction the bike moves in the +y direction. Take +x to be towards the right side of the page, and +z to be out of the page (up towards you). What is the vector direction of the angular momentum for one of the rolling wheels of the bike?

- a) $+x$
- b) $-x$
- c) $+z$
- d) $+y$
- e) $-y$

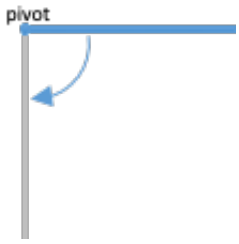
Question 6 (2 points)

An ice skater with rotational inertia I_0 is spinning with angular speed ω_0. She pulls her arms in, thereby increasing her angular speed to $4\omega_0$. What is her new rotational inertia?

- a) I_0
- b) $I_0/2$
- c) $I_0/4$
- d) $2I_0$
- e) $4I_0$

Question 7 (2 points)

A uniform bar of mass m and length L is pivoted at one end and falls towards the vertical. You are asked to find the final angular speed when it had fallen from rest to the vertical. What concept could you use?



a) Newton's 2nd Law combined with constant-acceleration kinematics

b) Conservation of energy

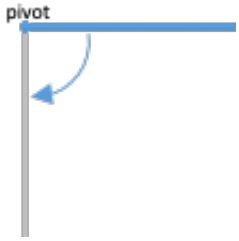
c) Conservation of angular momentum

d) All three above would work

e) Two of the three would work

Question 8 (2 points)

A uniform bar of mass m and length L is pivoted at one end and falls towards the vertical. You are asked to find the angular acceleration when it is just released from rest. What concept could you use?



a) Newton's 2nd Law for rotation

b) Conservation of energy

c) Conservation of angular momentum

d) All three above would work

e) Two of the three would work

Submit Quiz

0 of 8 questions saved