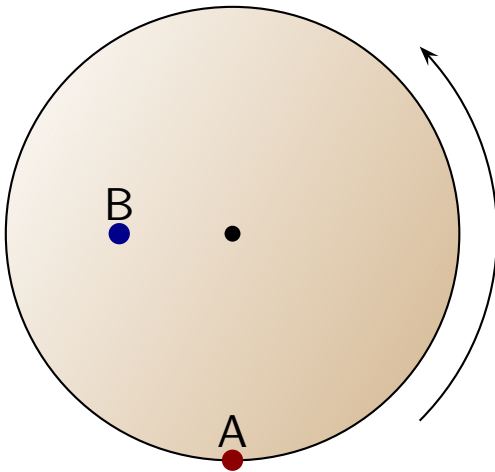


Question 1

A solid disk with uniform mass distribution rotates with a constant angular velocity about an axle through its center. Consider two small portions, each with the same mass. One is at the edge of the disk and the other halfway from the axle to the edge.

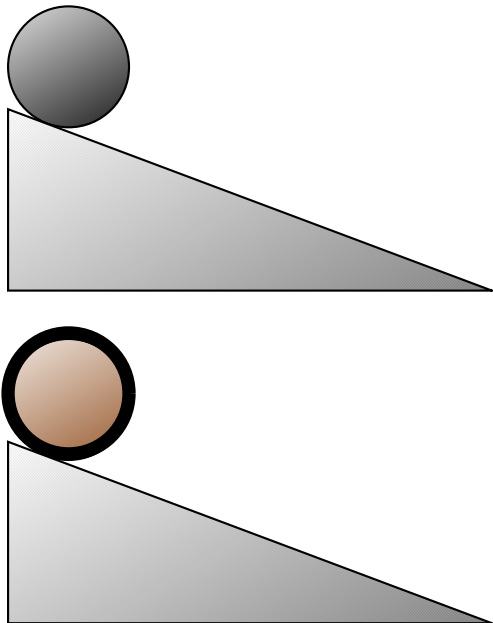


Which of the following is true regarding the kinetic energies of the two portions?

1. $K_A = 4K_B$
2. $K_A = 2K_B$
3. $K_A = K_B$
4. $K_A = \frac{1}{2} K_B$
5. $K_A = \frac{1}{4} K_B$

Question 2

Two circular objects with the same mass and radius are released from the same point on a ramp. In one of the objects, A, the mass is evenly distributed. In the other, B, it is concentrated at the rim.

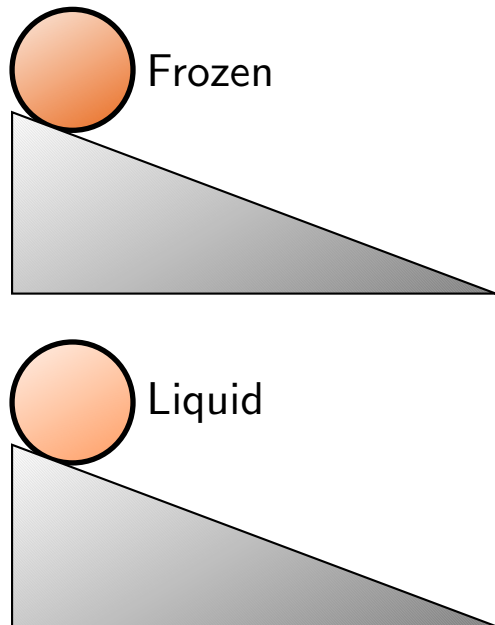


Which object reaches the bottom first?

1. A
2. B
3. Both reach at the same time.

Question 3

Two identical cylindrical cans of juice are released from the same point on a ramp. One of the cans is frozen solid and the solid juice rotates as the can rolls down the ramp. In the other can the juice is liquid and does not rotate.

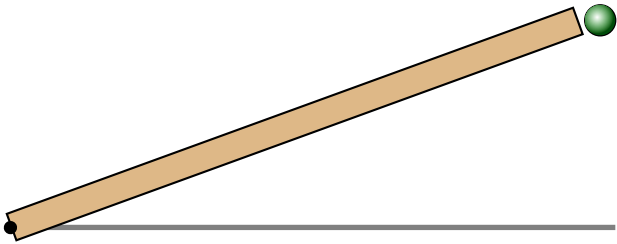


How do the speeds compare at the bottom of the ramp?

1. Same.
2. Faster for solid.
3. Faster for liquid.

Question 4

A rod is held at rest as illustrated. A ball is held alongside the tip, also at rest.



Which hits the ground first?

1. The tip of the rod.
2. The ball.
3. Both hit at the same time.