

PHY151H1F – Practice Problem Set 10

Ch. 11, Q. 33 (centripetal acceleration)

You hold a small ice cube near the top edge of a hemispherical bowl of radius 100 mm. When you release the cube from rest, what is the magnitude of its acceleration at the instant it reaches the bottom of the bowl? Ignore friction. ●●

Ch. 11, Q. 57 (conservation of angular momentum)

A 20-kg child running at 1.4 m/s jumps onto a playground merry-go-round that has inertia 180 kg and radius 1.6 m. She is moving tangent to the platform when she jumps, and she lands right on the edge. What is the rotational speed of the merry-go-round and the child if the merry-go-round started from rest? Ignore any friction in the axle about which the platform rotates. ●●

Ch. 12, Q. 51 (torque in rolling without slipping)

A 3.0-kg solid ball rolls without slipping down a ramp inclined to the horizontal at an angle of 30° . What are (a) the acceleration of the ball's center of mass and (b) the magnitude of the frictional force exerted on the ball? ●●

If you have free time and have completed all three of the questions on the front : Ch. 12, Q. 94 (conservation of angular momentum)

If everyone on Earth simultaneously walked from west to east, by what fraction would the length of the day change? Would it lengthen or shorten? ●●