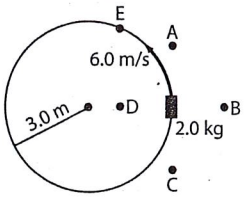
Review Questions

Base your answers to questions 88 through 96 on the following information and diagram.

A 2.0-kilogram cart travels counter-clockwise at a constant speed of 6.0 meters per second in a horizontal circle of radius 3.0 meters.



88. Calculate the magnitude and direction of the centripetal acceleration of the cart at the position shown.

89. Calculate the magnitude of the centripetal force acting on the cart.

90. If the mass of the cart was doubled, the magnitude of the centripetal force acting on the cart would be

(1) halved (3) quartered
(2) doubled (4) quadrupled

91. If the radius of curvature of the path was doubled, the magnitude of the centripetal acceleration of the cart would be

(1) halved (3) quartered
(2) doubled (4) quadrupled

92. If the speed of the cart was doubled, the magnitude of the centripetal force on the cart would be

(1) halved (3) quartered
(2) doubled (4) quadrupled

93. If the mass of the cart was halved, the magnitude of the centripetal acceleration of the cart would

(1) decrease (2) increase (3) remain the same

94. In the position shown in the diagram, towards which point is the centripetal force acting on the cart directed?

95. In the position shown in the diagram, towards which point is the velocity of the cart directed?

96. Which factor, when doubled, would produce the greatest change in the magnitude of the centripetal force acting on the cart?

(1) mass of the cart
(2) radius of curvature of the path
(3) speed of the cart
(4) weight of the cart

97. As the time taken for a car to make one lap around a circular track decreases, the centripetal acceleration of the car

(1) decreases (2) increases (3) remains the same

98. The tangential acceleration of a cart moving at a constant speed in a horizontal circle is

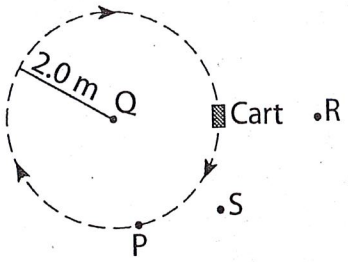
(1) 0.0 m/s^2
(2) 9.8 m/s^2 in the direction of the velocity
(3) constant in magnitude and directed radially toward the center of curvature
(4) constant in magnitude and directed radially away from the center of curvature

99. The centripetal acceleration of a ball of mass m moving at constant speed v in a horizontal circular path of radius r is

(1) zero
(2) constant in direction, but changing in magnitude
(3) constant in magnitude, but changing in direction
(4) changing in both magnitude and direction

Base your answers to questions 100 through 103 on the following information and diagram.

A 5.0-kilogram cart travels clockwise in a horizontal circle of radius 2.0 meters at a constant speed of 4.0 meters per second



100. Towards which point is the velocity of the cart directed at the position shown?

101. Towards which point is the centripetal acceleration of the cart directed at the position shown?

102. If the mass of the cart was doubled, the magnitude of the cart's centripetal acceleration would be

(1) unchanged (3) halved
(2) doubled (4) quadrupled

103. The magnitude of the centripetal force acting on the cart is

(1) 8.0 N (2) 20. N (3) 40. N (4) 50. N