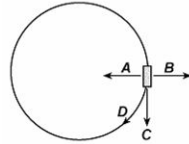


Name \_\_\_\_\_  
 Regents Physics  
 Period \_\_\_\_\_

Date \_\_\_\_\_  
 Unit 3 WS 3  
 Mr. Moy

### Circular Motion

1. In the diagram below, a cart travels clockwise at a constant speed in a horizontal circle.

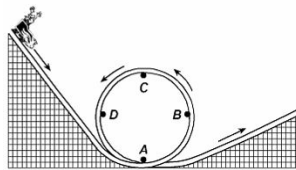


At the position shown in the diagram, which arrow indicates the direction of the centripetal acceleration of the cart?

- A. A                      B. B                      C. C                      D. D

Questions 2 and 3 refer to the following:

A roller coaster cart starts from rest and accelerates, due to gravity, down a track. The cart starts at a height that enables it to complete a loop in the track. [Neglect friction.]



2. Which diagram best represents the path followed by an object that falls off the cart when the cart is at point D?



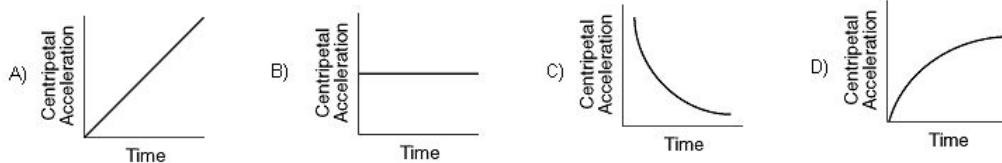
3. The magnitude of the centripetal force keeping the cart in circular motion would be greatest at point

- A. A                      B. B                      C. C                      D. D

4. In the diagram below, S is a point on a car tire rotating at a constant rate.



Which graph represents the magnitude of the centripetal acceleration of point S as a function of time?



5. A 2.6 kg object is being swung in a circle of radius 3.2 meters at a constant speed of 4.4 m/s.
- What is the centripetal acceleration of the object?
  
  
  
  
  
  
  
  
  
  
  - What is the force that is needed to keep the object moving in a circle?
6. Sid E. Leitz is practicing his lasso skills for the big summer rodeo. He ties a 27 kg mass to the end of a rope and is swinging it at a constant speed of 11 m/s. If the rope is 2.0 meters long, what is the tension in the rope?
7. An object of mass  $m$  is moving in a circle of radius  $r$  at a speed  $v$ .
- What happens to the centripetal force if the mass is doubled?
  
  
  
  
  
  
  
  
  
  
  - What happens to the centripetal force if speed is doubled?