

### Acceleration and Circular Motion

Read from **Lesson 1** of the **Circular and Satellite Motion** chapter at **The Physics Classroom**:

<http://www.physicsclassroom.com/Class/circles/u6l1b.html>

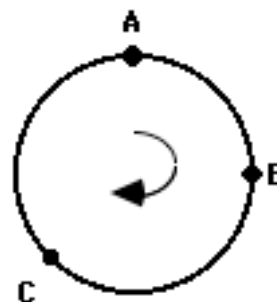
**MOP Connection:** Circular Motion and Gravitation: sublevel 2

**Review:**

- Accelerating objects are \_\_\_\_\_. Choose the one *most inclusive* answer.
  - going fast
  - speeding up (only)
  - speeding up or slowing down
  - changing their velocity
- Identify the three controls on an automobile that are responsible for causing the car to accelerate.

**Acceleration and Circular Motion:**

- A car that is moving in a circle at a constant speed of 30 mi/hr is \_\_\_\_\_.
  - not accelerating since there is no change in velocity
  - not accelerating despite the fact that there is a change in velocity
  - accelerating since there is a change in velocity
  - accelerating despite the fact there is no change in velocity.
  - accelerating, but not for either reason mentioned above.
- An object that is moving in a circle at a constant speed has a velocity vector that is directed \_\_\_\_\_ and an acceleration vector that is directed \_\_\_\_\_.
  - tangent to the circle, tangent to the circle
  - tangent to the circle, outwards
  - tangent to the circle, inwards
  - inwards, tangent to the circle
  - inwards, outwards
  - outwards, tangent to the circle
- An object moves in a clockwise direction along the circular path as shown in the diagram at the right. Three points along the path are labeled - A, B and C. For each location, **draw** a straight-line vector arrow in the direction of the velocity vector; label this vector as **v**. Then **draw** a straight-line vector arrow in the direction of the acceleration vector; label this vector as **a**.



- An object that is moving in uniform circular motion will **definitely** have a large acceleration if it is \_\_\_\_\_.
  - moving very fast
  - moving along a sharp turn
  - turning at a rapid rate

Justify your answer:

**Interesting Fact:**

The moon orbits about the Earth with an average speed of just over 1000 m/s; yet its acceleration is less than 0.003 m/s<sup>2</sup>. The moon is a fast-moving object with a low acceleration.