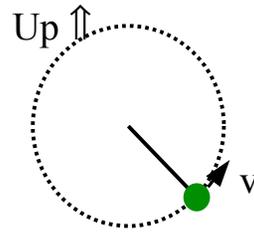An object is moving in a vertical circle. At one instant, it is moving at a speed v as shown. Think about force equations for this motion. Which of the following is true?

Up ⇧ ...



v

1) Gravity and the vertical component of the string tension must be equal.

2) The string tension and the component of gravity along the string must cancel.

3) This motion requires a force in addition to the string tension and gravity.

4) The horizontal component of the string tension must be zero because gravity has no horizontal component.

5) The sum of all of the forces must have a component to the upper right to keep the ball moving.

6) Gravity and the vertical component of the string tension might be equal.

7) More than one of the above.

8) None of the above.

A ball going around the loop-the-loop leaves the track at some point. At that instant, which of the following is true?

1) The velocity along the track is zero.

2) The acceleration along the track is zero.

3) The total velocity is zero.

4) The total acceleration is zero.

5) Both the velocity and acceleration are zero.

6)   The normal force is zero.

7) Gravity is zero.

8) My understanding of this situation is zero.

9) More than one of the above.

10) None of the above.