

Displacement versus Distance

An object goes from one point in space to another. After it arrives at its destination, its displacement:

- 1) can be either greater than or equal to
- 2) must be greater than
- 3) must be equal to
- 4) can be either smaller than or equal to
- 5) must be smaller than
- 6) can be either smaller or larger than or equal to

the distance it traveled.

Velocity and Acceleration

You are throwing a ball straight up in the air. At the highest point in this motion, the ball's

- 1) velocity and acceleration are both zero.
- 2) velocity is nonzero but its acceleration is zero.
- 3) acceleration is nonzero, but its velocity is zero.
- 4) velocity and acceleration are both nonzero.

Velocity and Acceleration

You are throwing a ball straight up in the air. At all points in the motion (except when either the acceleration or velocity is zero) the ball's

- 1) velocity and acceleration are both positive or both negative.
- 2) velocity and acceleration are opposite signs, one is positive when the other is negative.
- 3) velocity and acceleration are sometimes the same sign, sometimes opposite signs.
- 4) the answer depends on the choice of the coordinate system.

Velocity of a ball

I hold a ball at eye level, drop my hand, then throw the ball up in the air. I catch the ball above my eyes, lowering my hand then raising it back up to eye level. Not counting the initial and final points (where the ball is at rest in my hand) at how many points in this motion is the **velocity** equal to zero?

- 1) One
- 2) Two
- 3) Three
- 4) Four
- 5) Five
- 6) More than five
- 7) Never

Acceleration of a ball

I hold a ball at eye level, drop my hand, then throw the ball up in the air. I catch the ball above my eyes, lowering my hand then raising it back up to eye level. Not counting the initial and final points (where the ball is at rest in my hand) at how many points in this motion is the **acceleration** equal to zero?

- 1) One
- 2) Two
- 3) Three
- 4) Four
- 5) Five
- 6) More than five
- 7) Never

Falling Stones - II

Two stones are released from rest at a certain height, one a short time after the other. As they fall, will difference in their **vertical position**

- 1) increase over time
- 2) decrease over time
- 3) stay the same

Falling Stones - I

Two stones are released from rest at a certain height, one a short time after the other. As they fall, will the difference in their **speeds**

- 1) increase over time
- 2) decrease over time
- 3) stay the same

Falling Stones - III

Two stones are released from rest at a certain height, one a short time after the other. Will the difference in time between the instants at which they hit the ground be

- 1) smaller than
- 2) equal to
- 3) larger than

the difference in time between the instants at which they were released?