

Problem 1

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

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

the distance it traveled.

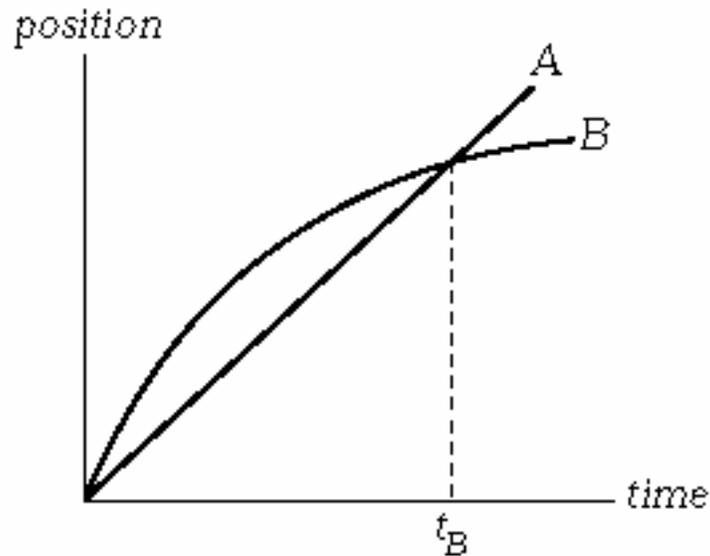
Problem 2

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

- 1) velocity and acceleration are 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.

Problem 3

The graph shows position as a function of time for two trains running on parallel tracks. Which is true:



- 1) At time t_B , both trains have the same velocity.
- 2) Both trains speed up all the time.
- 3) Both trains have the same velocity at some time before t_B .
- 4) Somewhere on the graph, both trains have the same acceleration.

Problem 4

Two stones are released from rest at a certain height, one after the other. Will the difference in their speeds

- 1) Increase
- 2) decrease,
- 3) or stay the same?

Problem 5

Two stones are released from rest, at the same height above the ground, one after the other. Will their vertical separation distance

- 1) increase
- 2) decrease,
- 3) or stay the same?

Problem 6

Two stones are released from rest, at the same height above the ground, one after the other. Will the time interval between the instants at which they hit the ground be

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

the time interval between the instants of their release?

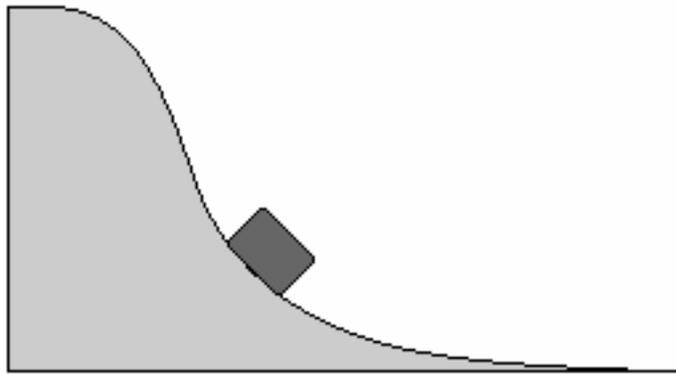
Problem 7

A person standing at the edge of a cliff throws one ball straight up and another ball straight down, each at the same initial speed. Neglecting air resistance, the ball to hit the ground below the cliff with the greater speed is the one initially thrown

- 1) upward;
- 2) downward;
- 3) neither; they both hit at the same speed.

Problem 8

A cart on a roller-coaster rolls down the track shown below. As the cart rolls beyond the point shown, what happens to its speed and acceleration in the direction of motion?



- 1) Both decrease;
- 2) The speed decreases, but the acceleration increases;
- 3) Both remain constant;
- 4) The speed increases, but acceleration decreases;
- 5) Both increase;
- 6) Some other combination.