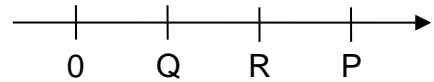




## Kinematics Quiz

1. A person initially at point P in the illustration on the right stays there a moment, and then walks along the axis to Q and stays there a moment. She then runs quickly to R, stays there a moment, and then strolls slowly back to P. Which of the position vs. time graphs correctly represents this motion?



2. An object goes from one point in space to another. After it arrives, which statement correctly compares distance travelled and displacement?

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| <b>A</b> displacement $\leq$ distance | <b>D</b> displacement $\geq$ distance |
| <b>B</b> displacement $<$ distance    | <b>E</b> displacement $>$ distance    |
| <b>C</b> displacement = distance      | <b>F</b> displacement $\neq$ distance |

3. If you drop an object in the absence of air resistance, it accelerates downwards at  $9.8 \text{ m/s}^2$ . If instead you throw it downwards, the object's downwards acceleration after you let go is:

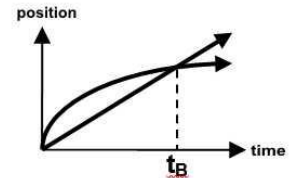
- |   |  |
|---|--|
| <b>A</b> a constant less than $9.8 \text{ m/s}^2$ | <b>C</b> a constant greater than $9.8 \text{ m/s}^2$ |
| <b>B</b> $9.8 \text{ m/s}^2$                      | <b>D</b> increasing as it falls                      |



4. A person standing at the edge of a cliff throws a ball straight up and an identical ball straight down at the same initial speed. Neglecting air resistance, the ball that lands with the higher speed is:

- A** the ball that was thrown up
- B** the ball that was thrown down
- C** They'll land with the same speed.
- D** More information is needed to be sure.

5. The graph on the right plots the positions of two trains running on parallel tracks. The time  $t_B$  represents the point where the intersection of the two graphs is. From the graph we can know that:



- A** both trains have the same velocity at some point before  $t_B$
- B** at  $t_B$  both trains have the same velocity
- C** both trains are constantly speeding up
- D** at some point both trains have the same acceleration

6. You throw a ball straight up in the air. At its highest point, the ball has:

- A** zero velocity and zero acceleration
- B** non-zero velocity and zero acceleration
- C** zero velocity and non-zero acceleration
- D** non-zero velocity and non-zero acceleration

7. A roller coaster car coasts freely down its track. As the car passes the indicated point on the track, and the track levels out, what happens to speed and acceleration?

- A** both  $v$  and  $a$  decrease
- B**  $v$  decreases,  $a$  increases
- C**  $v$  and  $a$  remain constant
- D**  $v$  increases,  $a$  decreases
- E** both  $v$  and  $a$  increase
- F**  $v$  increases,  $a$  remains constant



