

Know these for the test:

$$1. v = v_o + at \quad 2. x = x_o + v_o t + \frac{1}{2}at^2$$

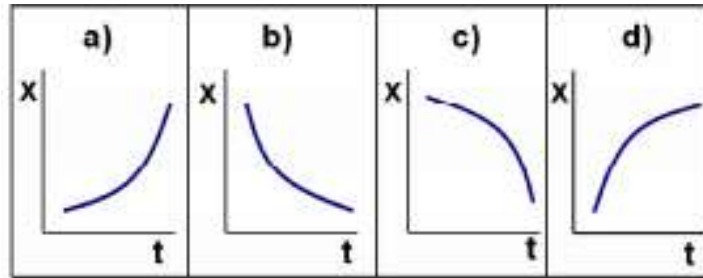
Physics- 1-D Motion- Quiz

1. A ball is pushed with an initial velocity of 4.0 m/s. The ball rolls down a hill with a constant acceleration of 1.6 m/s^2 . The ball reaches the bottom of the hill in 8.0 s. What is the ball's **velocity** at the bottom of the hill?
a. 17 m/s b. 12 m/s c. 16 m/s d. 10 m/s
2. You throw a ball up with an initial speed of 30 m/s. **How long** does it take for the ball to **return to your hand**?
a. 2 s b. 3 s c. 4 s d. 6 s e. 9 s
3. You throw a ball up with an initial speed of 30 m/s. What is its **maximum height**?
a. 15 m b. 45 m c. 180 m d. 150 m e. 140 m
4. You drive for 30 minutes at 30 mi/hr and then for another 30 minutes at 50 mi/hr. What is your **average speed** for the whole trip?
a. more than 40 mi/hr b. equal to 40 mi/hr
c. less than 40 mi/hr d. not enough information
5. When throwing a ball straight up, which of the following is true about its velocity and acceleration at the **highest point** in its path?
a. both $v \neq 0$ and $a \neq 0$ b. $v=0$, but $a \neq 0$ c. $v \neq 0$, but $a=0$
d. $v=0$ and $a=0$ e. not enough information
6. If the velocity of a car is **non-zero ($v \neq 0$)**, can the acceleration of the car be zero?
a. Absolutely yes! b. Surely not! c. It depends on the velocity
7. Which of the following is a **scalar**?
a. velocity b. acceleration c. displacement d. distance
8. Who is Mr. Dufrene's favorite student?
a. Isaac Newton b. Mary Guidry c. The girl in the front row d. ME!!!

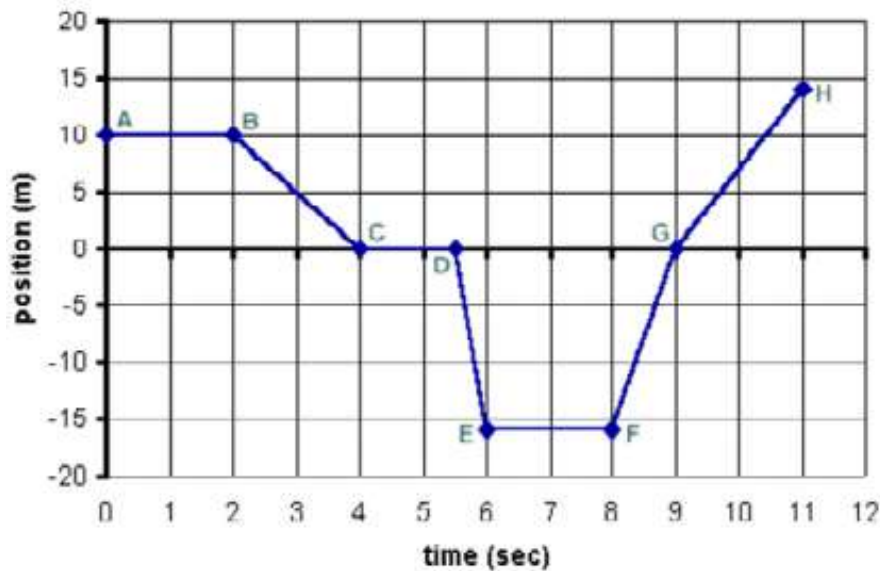
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9. A car begins at a velocity of 30 m/s and ends at a velocity of 20 m/s. Which of these **position versus time** graphs represent this motion?



10. Consider the following graph. What is the **velocity** at $t = 8.5$ s? **Hint: Point F: (8,-16)**



- a. 3 m/s b. 0.06 m/s c. 16 m/s d. -0.67 m/s
11. Consider the graph in the preceding question. What is the **average velocity** between points E & H ($t = 6$ and $t = 11$ seconds, respectively)?
- a. 6 m/s b. 0.4 m/s c. 2 m/s d. -3 m/s
12. A car is initially at rest and accelerates at a constant rate. In the first 10 seconds, it travels 100 meters. How far has the car travelled after 20 seconds (from the beginning)? **Hint: You need to find acceleration first!**
- a. 200 m b. 400 m c. 800 m d. 1000 m

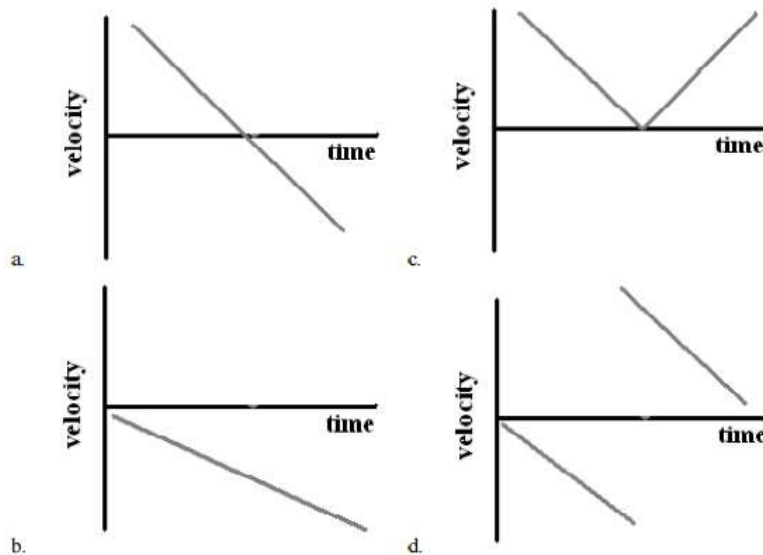
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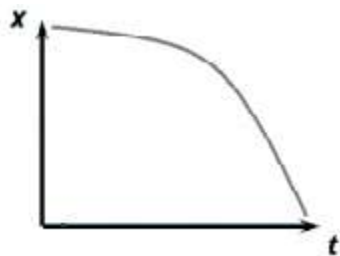
13. A truck covers 100.0 m in 10.0 s while smoothly slowing down to a stop. What was its initial velocity? **HINT: You will need both kinematics equations to solve this problem, as well as use substitution.**

a. 40.0 m/s b. 5.00 m/s c. 20.0 m/s d. 10.0 m/s

14. You throw a ball up into the air and it returns to your hand. Which of these plots best describes the motion of the ball from **the moment you release it to the moment you catch it?**



15. Describe the **speed and velocity** from the position versus time graph below.



- a. Increasing speed, positive velocity
b. Increasing speed, negative velocity
c. Decreasing speed, positive velocity
d. Decreasing speed, negative velocity

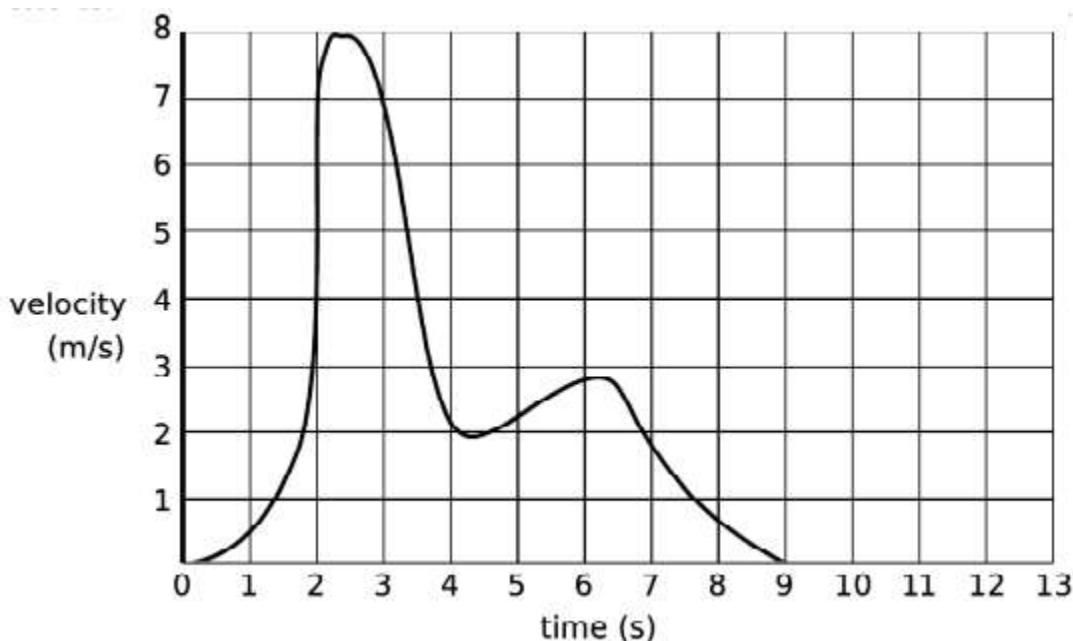
16. A bowling ball and a feather are dropped at the same time in a vacuum (no air resistance) from a height of 300 meters. Which hits the ground **first**?

a. bowling ball b. feather c. both hit at the same time d. neither- they float

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17. Using the velocity vs. time graph below, calculate the **total distance** the particle has traveled from $t = 0$ to $t = 4$ seconds.



- a. 25 m b. 210 m c. 0 m d. 13 m
18. As your best friend nervously awaits the arrival of his prom date, you decide to drop a water balloon on him from the top of your apartment building. Assuming the water balloon's initial velocity was 0 m/s, what was the water balloon's final velocity as it fell 100 m onto your friend? **HINT: You will need both kinematics equations to solve this problem.**
- a. -44 m/s b. -63 m/s c. 44 m/s d. 63 m/s
19. Which of the following is **NOT** true?
- a. Vectors have a direction while scalars do not.
 - b. The slope of a velocity vs. time graph is acceleration.
 - c. Distance depends only on your initial and final position.
 - d. In order for a car to speed up, both velocity and acceleration have to have the same sign, i.e., both positive or both negative.
20. Susan hikes 6 miles East, 15 miles North, 1 mile West, and 3 miles South. What is her **displacement**?
- a. 13 miles Northeast b. 13 miles Southwest
- c. 19 miles Northeast d. 19 miles Southwest