$$v_f = v_0 + at \qquad d = v_0t + \tfrac{1}{2}at^2 \qquad v_{avg} = d/t \qquad v_f^2 = v_0^2 + 2ad$$

Unit 0 and Unit 1 Physics Challenge: Science Practice & 1D Motion

1. A variable that remains <u>unchanged</u> throughout an experiment is called a:
    A. Experimental variable
    B. Independent variable
    C. Dependent variable
    D. Controlled variable

2. Nascar tests out a 3 new tire brands. After a few trials, the average velocity of cars using brand B increases by 5 km/hr with the new tires. In this investigation, the brand of tires is the _____ variable.
    A. Control
    B. Dependent
    C. Independent
    D. Natural

3. Usain Bolt, the fastest man alive from the 2008 Olympics, goes golfing. He walks at an average rate of 3.20 meters per second on the golf course. The amount of time required for him to walk from the tee to a green 612 meters away is:
    A. 0.544 minutes
    B. 1.91 minutes
    C. 1,958 seconds
    D. 191 seconds

4. Using the graph to the right, approximately how far does the car travel in 0.6 seconds?
    A. 20m
    B. 30m
    C. 40m
    D. 60m

Distance v. Time

5. Which of the following are vectors?
    A.   Displacement, velocity and acceleration
    B.   Distance, speed and acceleration
    C.   Distance, position and acceleration
    D.   Displacement, speed, and acceleration

6. Distance is to displacement as speed is to ….
    A.   Acceleration
    B.   Position
    C.   Direction
    D.   Velocity
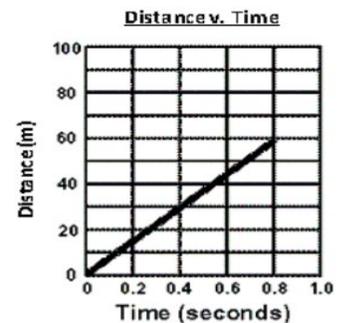
7. Two cars are traveling down a straight track, to the right are their speeds at three points. Which car had the greater acceleration?
    a.   Car I
    b.   Car II

Car I	v = 0 mi/hr	v = 10 mi/hr	v = 20 mi/hr
Car II	v = 200 mi/hr	v = 200 mi/hr	v = 200 mi/hr

$$v_f = v_0 + at \qquad\qquad d = v_0t + \tfrac{1}{2}at^2 \qquad\qquad v_{avg} = d/t \qquad\qquad v_f^2 = v_0^2 + 2ad$$

8. A car starts from rest, and after 7.0 seconds it is moving at 42 m/s. What is the car's average acceleration?
   A. 0.17 m/s^2
   B. 6.0 m/s^2
   C. 35 m/s^2
   D. 290 m/s^2

9. A car is traveling with a negative velocity but has a positive acceleration. What is happening to the car?
   A. Slowing down
   B. Speeding up
   C. Traveling at constant velocity
   D. Instantaneously changes direction

10. A car rolls down a steep ramp. Which position-time graph best describes its' motion?
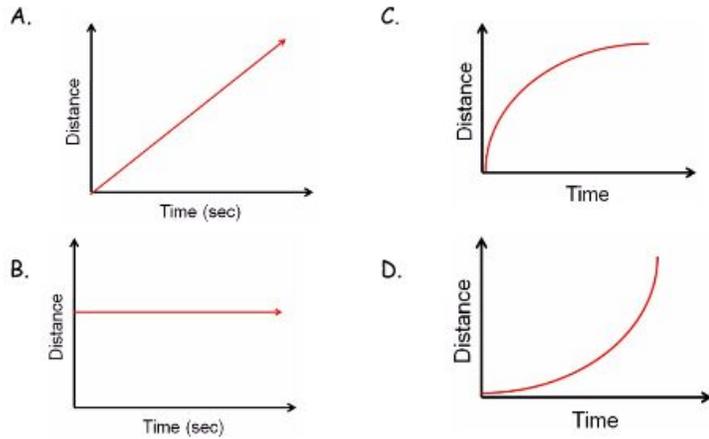
11. Which of the following is a velocity-time graph of the car rolling down the ramp?
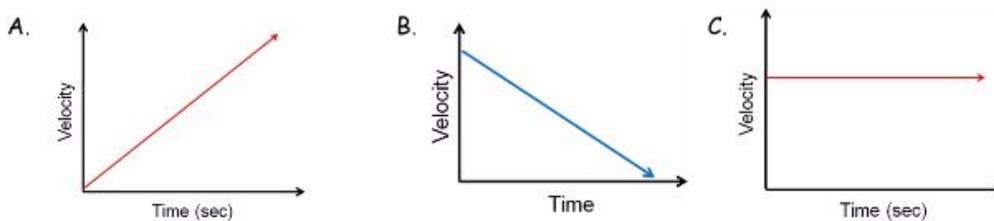
12. An elevator is moving upward 1.20 m/s when it experiences an acceleration of -0.31 m/s^2 downward for 2 seconds. Please show your work for credit!
Part A: What is the elevator's final velocity?
V_i=
V_f=
a=
t=

Part B: How FAR did the elevator travel?
d=