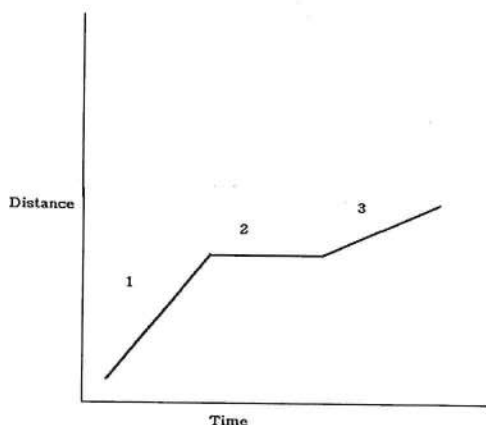1. Define both displacement and distance and than thoroughly explain the difference between displacement and distance?

   A - - - B        A∿B

2. Be able to answer questions concerning a graph. List what's taking place at each number on the graph.



Distance ... Time

   1.) Constant speed (fast)
   2.) Stand still
   3.) Constant speed (slow)

3. A tennis ball is thrown vertically upward with an initial velocity of 47 m/s. How long will it take for the ball to reach the top?        $Vf = 0$        $a = (Vf-Vi)/time$    $g = 9.8$ m/s² (on Earth)

   $-9.8 = \dfrac{0-47}{t}$        $-9.8 = \dfrac{-47}{t}$    $t \cdot -9.8 = \dfrac{-47}{t} \cdot t$    $\boxed{4.8s}$

   $\dfrac{t \cdot -9.8}{-9.8} = \dfrac{-47}{-9.8} = \boxed{\text{4.8}}$

4. A boy walks a total distance of 210 m. If it takes him 36,900 s to make this trip, what is his speed?

   $S_{av} = \dfrac{\Delta d}{\Delta t}$        $S_{av}$ = average speed
   
   $d$ = distance
   
   $t$ = time

   $S = \dfrac{210}{36,900} = \boxed{.0057 \frac{m}{s}}$

5. With an average acceleration of 37 m/s² and an initial velocity of 120 m/s, what would his final velocity be if it takes him 56000 seconds?    $a = (Vf-Vi)/time$

   $6000$ •    $37 = \dfrac{Vf-120}{56000} \cdot 56000$        $2072000 = Vf - 120$
   $+120 \qquad +120$
   $\boxed{2072120 \frac{m}{s}}$

6. With an acceleration of -.4 m/s², how long will it take a cyclist to bring a bicycle with an initial velocity of 13.5 m/s to a complete stop (vf=0)?    $a = (Vf-Vi)/time$

   $t \cdot -.4 = \dfrac{0-13.5}{t} \cdot t$        $\dfrac{t \cdot -.4}{-.4} = \dfrac{-13.5}{-.4} = \boxed{33.75 s}$

**7.**

Sara will run a 3.1 mile race at an average pace of 9 miles an hour. How long will it take her to finish the race?

○ 0.25 hours

○ 1 7 hours

○ 2 9 hours

○ 0 34 hours

$$S_{av} = \frac{\Delta d}{\Delta t}$$
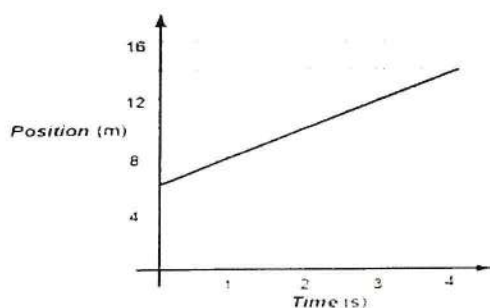
$S_{av}$ = average speed
$d$ = distance
$t$ = time

$$t \cdot 9 = \frac{3.1}{t} \cdot t \qquad \frac{t \cdot 9}{9} = \frac{3.1}{9} = \boxed{0.34}$$

What type of motion is represented on the graph?

**8.**



Position (m)

Time (s)

○ Standing still

◉ Constant speed

○ Speeding up

○ Slowing down

**9.**

A toy car is sent down a 5 m long track in a time of 3.13 seconds. What is the average speed of the car in m/s?

○ 15 65 m/s

○ 0 626 m/s

○ 1 6 m/s

○ 8 13 m/s

$$S_{av} = \frac{\Delta d}{\Delta t}$$

$S_{av}$ = average speed
$d$ = distance
$t$ = time

$$\frac{5}{3.13} = \boxed{1.6}$$

**10.**

What is the average velocity represented on the graph?



Position (m)

Time (s)

$$\frac{8}{4} = \boxed{2}$$

○ 1.5 m/s

○ 4 m/s
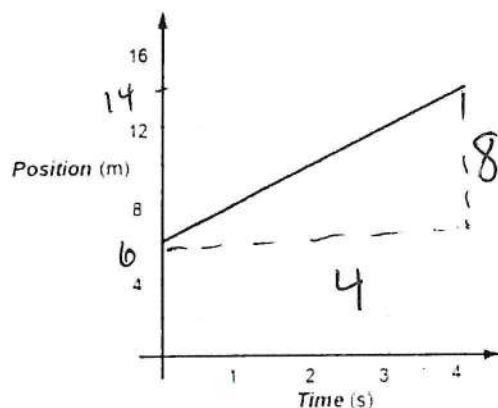
○ 2 m/s

11.  a = (Vf-Vi)/time

A robot changes velocity from 2 meters per second to 7 meters per second in a 3 second period. What is the acceleration?

- ○ 5.0 m/s
- ○ 5.0 m/s$^2$
- ○ 1.6 m/s
- ○ 1.6 m/s$^2$
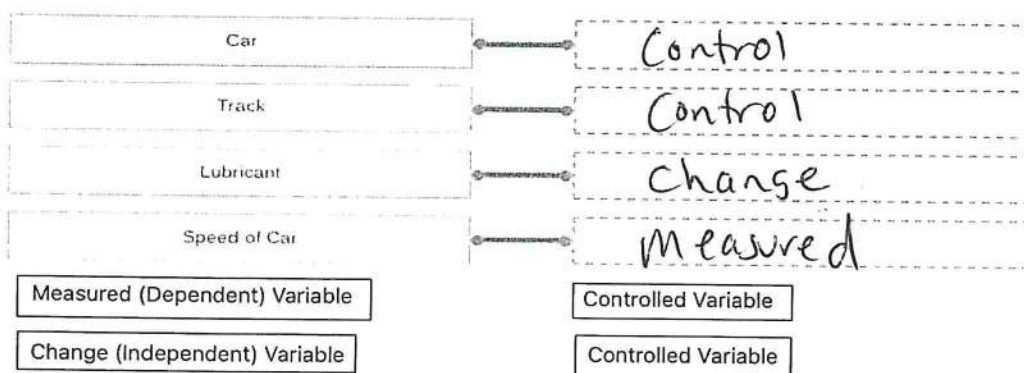
$$a = \frac{(7-2)}{3} = \boxed{1.6 \frac{m}{s^2}}$$

12.  What term describes a vehicle traveling north on a highway at 65 mph?

- ○ Angular speed
- ○ Linear speed
- ● Velocity
- ○ Acceleration

13.

John wants to conduct a test to see if a new lubricant on the axle of his toy car will increase the speed of his car on a 10 foot track. Identify the correct variables for his experiment. Match the term to its correct definition

| Track # 2 | Car #7 | | |
|---|---|---|---|
| | Trial #1 | Trial #2 | Trial #3 |
| Before Lubrication | 5.1 sec | 5.3 sec | 5.2 sec |
| After Lubrication | 4.7 sec | 4.9 sec | 4.8 sec |

| Car | → | Control |
| Track | → | Control |
| Lubricant | → | Change |
| Speed of Car | → | Measured |

| Measured (Dependent) Variable | | Controlled Variable |
| Change (Independent) Variable | | Controlled Variable |

14. What type of curve is the path of a projectile with no air resistance?  Parabola

15. A certain teacher throws a white board marker in the direction of her least favorite student. It stays in the air for 1.2 seconds. What is the height of the marker? g=-9.8m/s$^2$

Y = -.5 (g)(t$^2$)

$$y = .5(-9.8)1.2^2 = \boxed{7.056 m}$$