

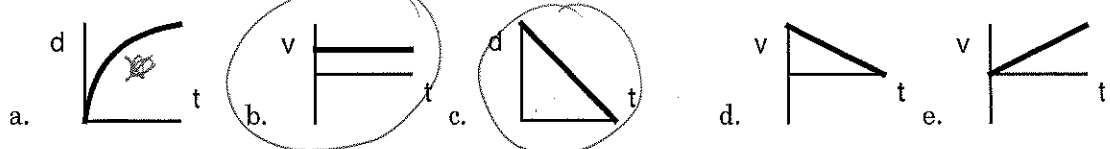
## Velocity & Acceleration

- Velocity tells you how quickly position changes and is the slope of a position vs time graph.
- Acceleration tells you how quickly velocity changes and is the slope of a velocity vs time graph.

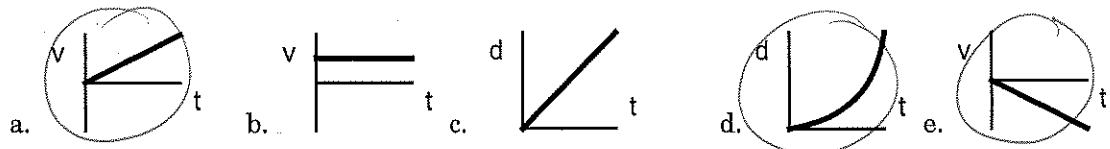
3. From the list of units below, circle all that are velocity and underline all that are acceleration.

m (m/s) kg/m (cm/s) km/h/s m/s<sup>2</sup> (mph) s/m m/s/s m<sup>2</sup>/s s kg  
 kg/s kg•m/s<sup>2</sup> s<sup>2</sup>/m (mile/min) (km/yr) (kph) mph/s

4. Which of the following graphs could show something that has a constant velocity?



5. Which of the following graphs could show something that has a constant acceleration?



6. There are three terms that often get confused: *constant speed*, *constant velocity* and *constant acceleration*. Explain what each means so that one of your confused friends could understand.

7. What is your speed for each of the following situations?

- You travel 100 miles in 2 hours. 50 mph
- You move 3 meters every second for 5 seconds. 3 m/s
- You stand still 10 meters away from your friend for 20 seconds. 0 m/s
- Starting 5 meters away from a friend, you end up 20 meters away from them after 3 seconds.  
 $20 - 5 = 15$   
 $\frac{15 \text{ m}}{3 \text{ s}} = 5 \text{ m/s}$

8. What is your acceleration for each of the following situations?

- You are speeding up at a constant rate of 3 m/s/s. 3 m/s<sup>2</sup>
- You have a constant speed of 30 mph for 5 seconds. 0 m/s<sup>2</sup>
- You slow down 15 mph in 3 seconds.  $\frac{-15 \text{ mph}}{3 \text{ s}} = -5 \text{ mph/s}$
- You speed up from 5 m/s to 25 m/s in 8 seconds.  
 $\frac{20}{8} = 2.5 \text{ m/s}^2$
- You have a constant velocity of 12 m/s for 4 seconds. 0 m/s<sup>2</sup>
- You speed up 8 m/s every second for 2 seconds. 8 m/s<sup>2</sup>

## Velocity & Acceleration

For each of the graphs shown below, do the following:

- calculate the slope of the line
- write the equation (using correct variables and units) that matches the line
- describe the motion using words
- make the other graph (velocity or position) that goes with the motion.

