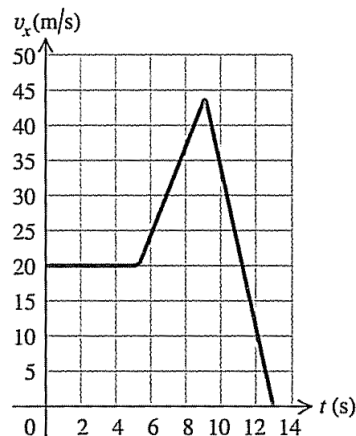


x, v, & a Express the dimensions of the following variables using the base dimensions of length and time.

1. position
2. velocity
3. acceleration

Describe how you would find the other 2 variables if given any 1 of the above. Do this for each variable.

Graphing Motion



Above is a plot of a car's velocity as a function of time.

- (a) Find the acceleration of the car at times $t = 3$ s, at $t = 7$ s, and at $t = 11$ s.
- (b) How far does the car travel between $t = 2$ s and $t = 13$ s?
- (c) Sketch a plot of the car's position as a function of time.
- (d) Sketch a plot of the car's acceleration as a function of time.

Appropriately scale and number the axes in both plots.

⁰Select problems may be modified from Walsh, Harrison, or the Internet.

Average Quantities Emily jogs 300 meters north in 10 minutes she then walks 100 meters south in 5 minutes. Find the following:

1. Emily's total distance traveled.
2. Emily's displacement
3. Emily's average speed.
4. Emily's average velocity.

Skateboarding Susie Susie is skateboarding on a straight sidewalk.

- She starts at rest at time $t = 0$ s.
- Over the course of the next two seconds, she accelerates at a constant rate up to 2 m/s north.
- She maintains this velocity for half a second.
- Then, she slows down to 0 m/s over the course of one second.
- She takes a brief pause of half a second.
- Finally, she takes three seconds to accelerate up to a velocity of 2 m/s south.

For the following plots, draw out a grid, scale the axis appropriately, and make sure you label both your horizontal and vertical axes!

Plot Susie's velocity as a function of time.

Plot Susie's acceleration as a function of time.

Plot Susie's position as a function of time.

How would both of these plots respectively relate to the velocity plot above?

Make sure you label your horizontal and vertical axes!