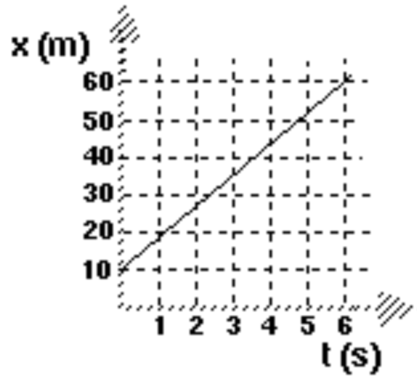
Unit 2 Constant Velocity - Review
Date: ________________

Payton Physics
Name: ______________________ Pd.____

1. Consider the position vs time graph at right.




a. Determine the average velocity of the object.

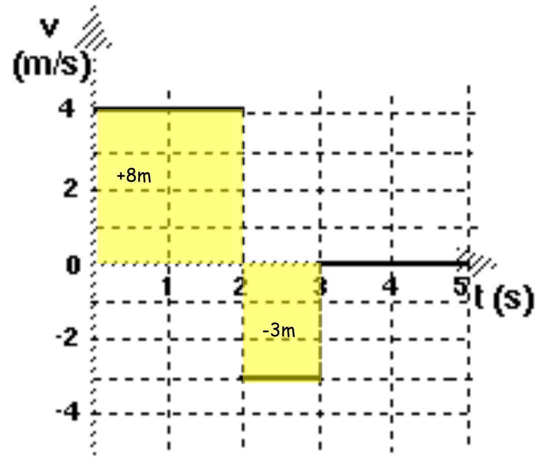
$x_i$=10m, $x_f$=60m → Δx=50m
$t_i$=0s, $t_f$=6s → Δt=6s

$$\vec{v} = \frac{\Delta x}{\Delta t} = \frac{50m}{6s} = 8.3\tfrac{m}{s}$$

b. Write a mathematical equation to describe the motion of the object.

$$x_f = 8.3\tfrac{m}{s}\Delta t + 10m$$

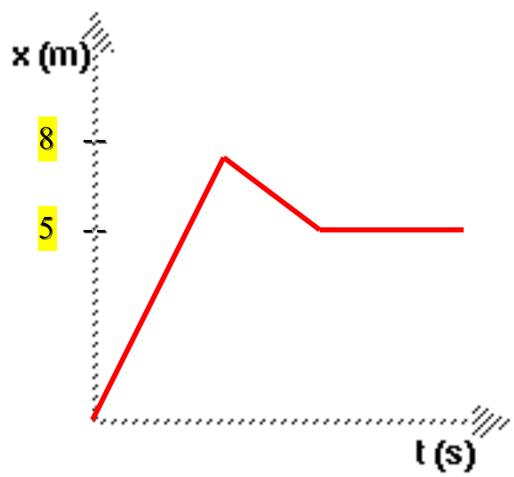
2. Shown at right is a velocity vs time graph for an object.




a. Describe the motion of the object.

Constant positive velocity (4 m/s) for 2 seconds, then constant negative velocity (-3m/s) for 1 second, then at rest for 2 seconds

b. Draw the corresponding position vs time graph. Number the x - axis.




c. How far did the object travel in the interval t =1s to t =2s?

4m → object is moving at +4 m/s during this 1 second interval.

d. What is the total displacement? Explain how you got the answer.

+5m → using the velocity graph to calculate displacement object moves +8m in first 2 seconds and then -3m in the next 1 second.

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3. Johnny drives to Wisconsin (1920 miles) in 32 hours. He returns home by the same route in the same amount of time.

a. Determine his average speed for the whole trip.

dist = 3840 mi, Δt=64 hr → Avg. speed = $\frac{dist}{\Delta t} = \frac{3840mi}{64hr} = 60\frac{mi}{hr}$

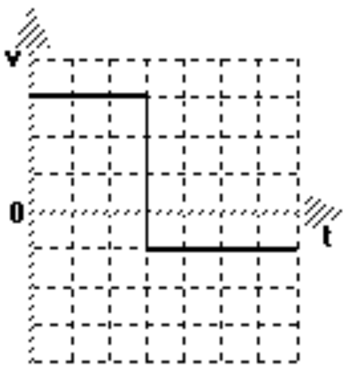
b. Determine his average velocity for the whole trip.

Δx = 0 mi, Δt=64 hr → $\vec{v} = \frac{\Delta x}{\Delta t} = \frac{0\,mi}{64\,hr} = 0\frac{mi}{hr}$

c. Compare these two values and explain any differences.

As we have said in class, velocity and speed will only be the same if the direction of motion never changes, it did change here, and so there is a difference between the two.

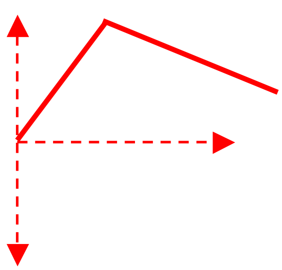
4. Consider the v vs t graph below.




a. Describe the behavior of the object depicted in the graph.

The object moves at a constant positive velocity and then a smaller constant negative velocity

b. Sketch an x vs t graph that represents the behavior of the object.



5. A race car travels at a speed of 95 m/s. How far does it travel in 12.5 s? Use the appropriate mathematical expression and show how units cancel.

$Speed = \frac{dist}{\Delta t}$ $95\frac{m}{s} = \frac{dist}{12.5s}$ $dist = 1187.5\frac{m}{\cancel{s}} \cdot \frac{\cancel{s}}{1}$

$dist = 1187.5\ m$