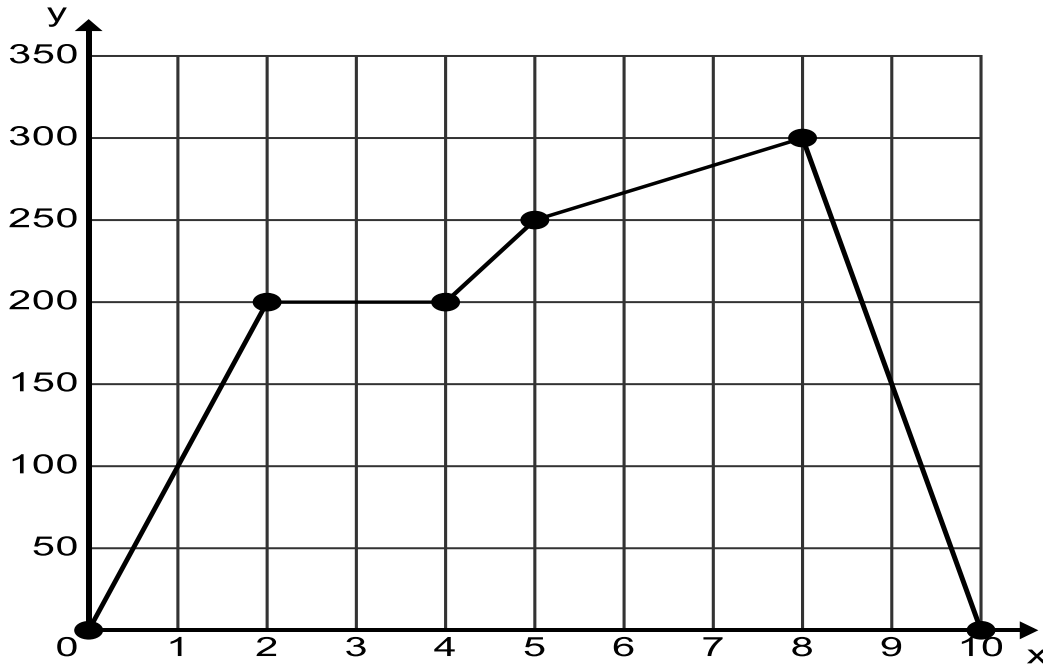# Review of 3.4 – Position, Velocity, Acceleration

1. Below is a graph of Ms. Orloff's position from home on a walk. The graph gives her position in feet with respect to time in minutes.

a) When is Ms. Orloff moving to the left? To the right? Standing still?
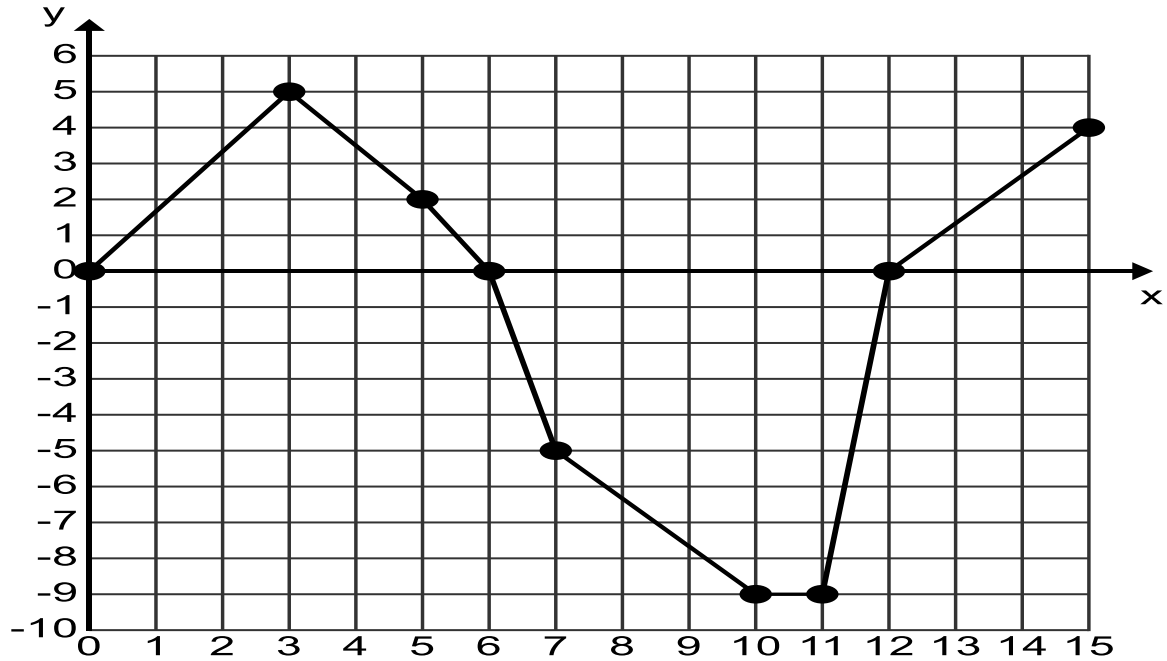
b) Sketch the graphs of Ms. Orloff's velocity and speed below.

Velocity graph: Speed graph:

c) During what time(s) was her speed the greatest? Explain.

2. The velocity of an object moving up and down on the y-axis is given below. The velocity is graph in meters per second and time is in seconds.

a) When does the object change direction?

b) When is the object moving upwards? Moving downwards?

c) Sketch a graph of the speed of the object.

d) Sketch a graph of the acceleration of the object.

e) When is the object speeding up? Slowing down? Staying the same speed?

f) When is the object moving the fastest? Explain.

3. The position of an object as it moves back and forth on the x-axis is given as the function $s(t) = t^3 - 12t^2 + 36t + 1$ where s is in feet and t is in seconds and $t \geq 0$.

a) Find the object's displacement over the first 5 seconds.

b) Find the average velocity over the first 5 seconds.

c) Find the instantaneous velocity at t = 2 seconds.

d) Find the acceleration at t = 2 seconds.

e) When is the particle moving to the right? To the left?

f) When is the particle speeding up? Slowing down?