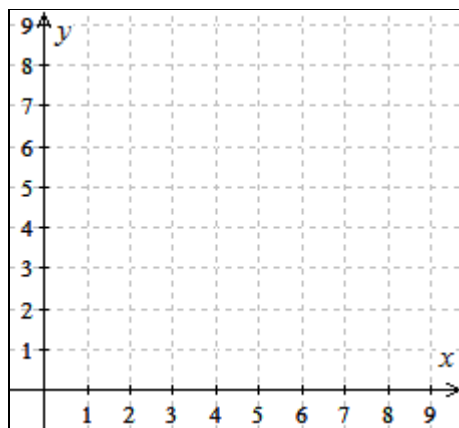


Extra Practice for Section V: Chapter 1

1. The functions $x = f(t)$ and $y = g(t)$ represent the x - and y -coordinates of a robot t seconds after it started moving around the floor of the lab. Use the values in the tables below to sketch a graph of the robot's motion; use arrows to indicate the direction of travel.

t	$x = f(t)$
0	6
1	3
2	2
3	7
4	6
5	8
6	8
7	1
8	4

t	$y = g(t)$
0	3
1	5
2	3
3	2
4	5
5	7
6	0
7	2
8	8

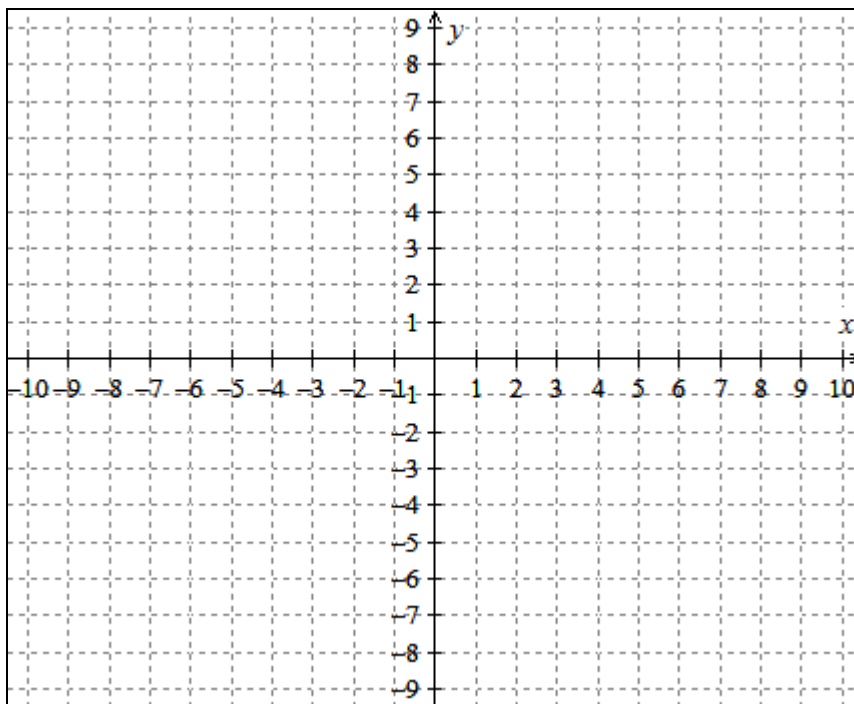


Draw a graph of the robot's motion here.

[Click here to see the solution to 1.](#)

2. Suppose that $x(t)$ and $y(t)$ (given in the box to the right) represent the x - and y -coordinates, respectively, of the movement of a robot t seconds after it starts moving. Sketch a graph of the motion of the robot for $0 \leq t \leq 4$ by plotting points for $t = 0$, $t = 1$, $t = 2$, $t = 3$ and $t = 4$ and then connecting those points with a smooth curve. Use arrows to indicate the direction of travel.

$$\begin{cases} x(t) = 7 - t^2 \\ y(t) = 4t - 8 \end{cases}$$



Draw a graph of the robot's motion here.

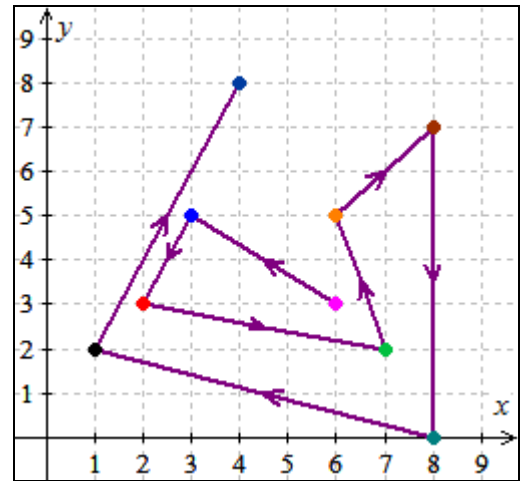
[Click here to see the solution to 2.](#)

Solution to 1.

1. The functions $x = f(t)$ and $y = g(t)$ represent the x - and y -coordinates of a robot t seconds after it started moving around the floor of the lab. Use the values in the tables below to sketch a graph of the robot's motion; use arrows to indicate the direction of travel.

t	$x = f(t)$
0	6
1	3
2	2
3	7
4	6
5	8
6	8
7	1
8	4

t	$y = g(t)$
0	3
1	5
2	3
3	2
4	5
5	7
6	0
7	2
8	8



A graph of the robot's motion.

(To help clarify the relationship between the tables and the graph, the values in the tables and the corresponding point on the graph have been given the same color.)

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Solution to 2.

2. Suppose that $x(t)$ and $y(t)$ (given in the box to the right) represent the x - and y -coordinates, respectively, of the movement of a robot t seconds after it starts moving. Sketch a graph of the motion of the robot for $0 \leq t \leq 4$ by plotting points for $t = 0$, $t = 1$, $t = 2$, $t = 3$ and $t = 4$ and then connecting those points with a smooth curve. Use arrows to indicate the direction of travel.

$$\begin{cases} x(t) = 7 - t^2 \\ y(t) = 4t - 8 \end{cases}$$

To graph the movement of this robot, we need to find and plot ordered pairs $(x(t), y(t))$. To find these ordered pairs, we need to choose values for t and find the corresponding values of x and y using the parametric equations given above.

$$t = 0: \quad \begin{cases} x(0) = 7 - 0^2 = 7 \\ y(0) = 4(0) - 8 = -8 \end{cases} \quad \text{So the robot is at } (7, -8) \text{ when } t = 0.$$

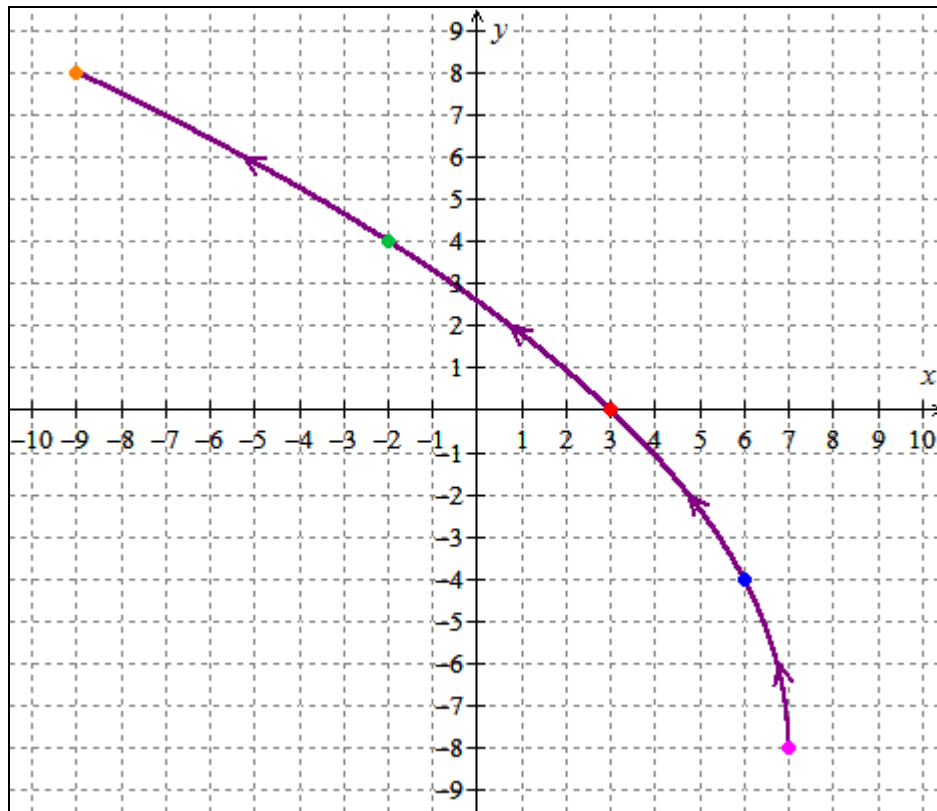
$$t = 1: \quad \begin{cases} x(1) = 7 - 1^2 = 6 \\ y(1) = 4(1) - 8 = -4 \end{cases} \quad \text{So the robot is at } (6, -4) \text{ when } t = 1.$$

$$t = 2: \quad \begin{cases} x(2) = 7 - 2^2 = 3 \\ y(2) = 4(2) - 8 = 0 \end{cases} \quad \text{So the robot is at } (3, 0) \text{ when } t = 2.$$

$$t = 3: \quad \begin{cases} x(3) = 7 - 3^2 = -2 \\ y(3) = 4(3) - 8 = 4 \end{cases} \quad \text{So the robot is at } (-2, 4) \text{ when } t = 3.$$

$$t = 4: \quad \begin{cases} x(4) = 7 - 4^2 = -9 \\ y(4) = 4(4) - 8 = 8 \end{cases} \quad \text{So the robot is at } (-9, 8) \text{ when } t = 4.$$

Now we can plot these points and connect them in order, starting with the point representing $t = 0$; we'll use arrows to keep track of the direction of travel:



A graph of the robot's motion.

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