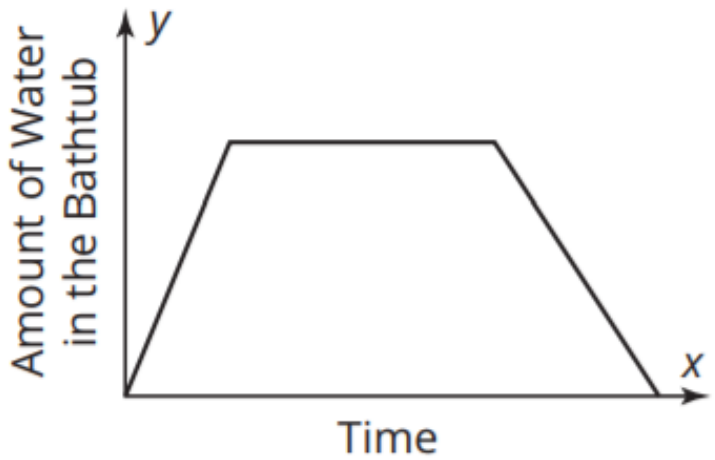
Warm Up

A graph that represents the amount of water in a bathtub is shown.



1. Is the relation a function? Why or why not?

2. Describe the problem situation in each of the 3 pieces of the graph.

3. Did the bathtub fill or drain faster? How do you know?

Your teacher is going to read a scenario line by line.

1. **As each line is read, graph that piece of the scenario.**

Reflect on your process and the mathematics by responding to these questions.

2. **Will everyone in class have the exact same graph? Explain your reasoning.**

3. **What clues from the scenario did you use to decide how steep to make each line segment?**

4. **How did you determine the length of each line segment?**

5. **How many segments does your graph have? What does this indicate about the scenario?**

6. **Does your graph have any horizontal line segments? If so, what do they represent? If not, explain why not.**

7. Does your graph have any decreasing line segments? If so, what do they represent? If not, explain why not.

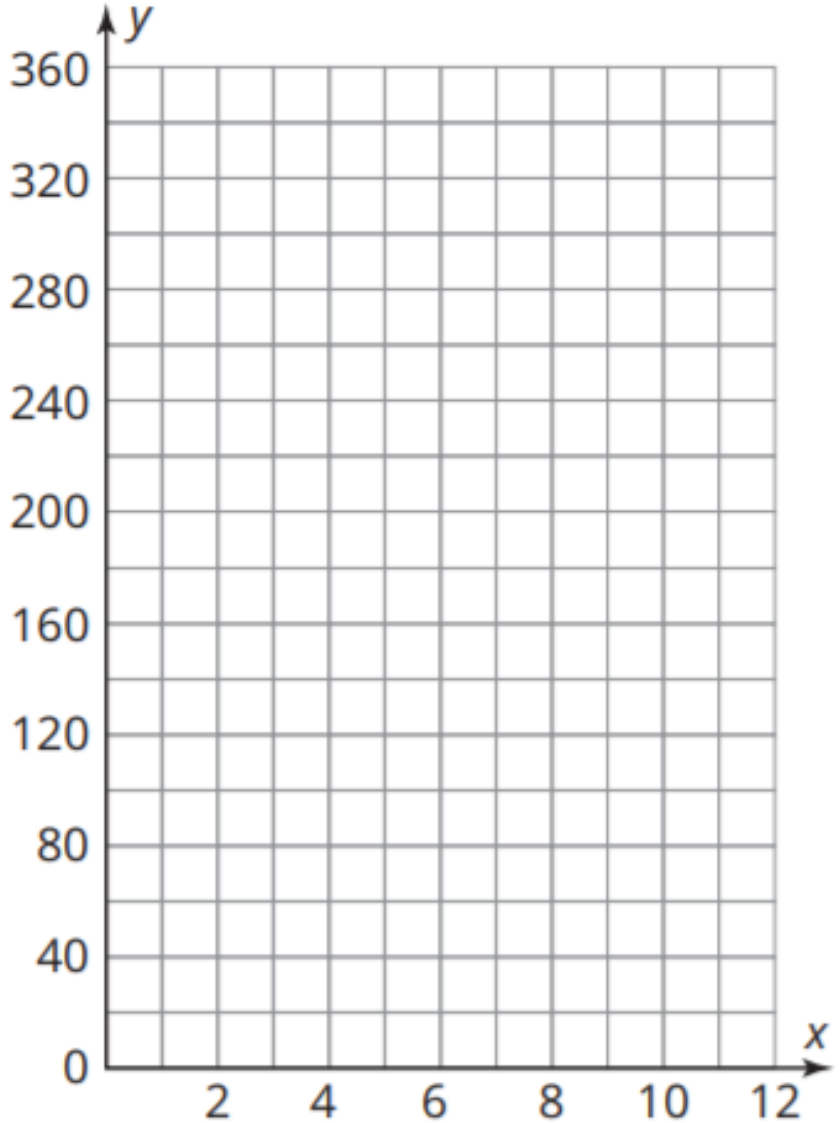
8. Does your graph have any increasing line segments? If so, what do they represent? If not, explain why not.

9. What do the *y*-intercept and *x*-intercept represent?

Paulina owns a popular pizza parlor. She noticed a daily trend in her pizza sales. When her shop opens for lunch at 11 AM, she sells 30 pizzas each hour for the first three hours. Sales dwindle to 10 pizzas per hour for the next 3 hours. Business picks up from 5 PM until closing time at 11 PM, when she sells 40 pizzas each hour for all 6 hours.

1. **Represent this problem situation with a table of values and a graph. Don't forget to label your axes.**

Time of Day	Number of Hours Since the Pizza Shop Opened	Total Number of Pizzas Sold
11 AM	0	0
12 PM		
1 PM		
2 PM		
3 PM		
4 PM		
5 PM		
6 PM		
7 PM		
8 PM		
9 PM		
10 PM		
11 PM		



The graph that you created represents a piecewise function. A **piecewise function** is a function that can be represented by more than one function, each which corresponds to a part of the domain. A **linear piecewise function** is a function that can be represented by linear functions only, each of which corresponds to a part of the domain.

2. **Use the graph and table to answer each question.**

   a. **Identify the domain of this problem situation.**

   b. **How many pieces make up this function? What is the domain of each piece?**

3. **Determine the equation that represents each piece of the function for each given time period. Show your work.**

   a. **from 0 to 3 hours**

   b. **from more than 3 hours to 6 hours**

   c. **from more than 6 hours to 12 hours**

4. To write a piecewise function, you must write the equation followed by its domain for each piece of the function. Complete the function by transferring the information from Question 3 into the proper format. Define your variables.

$$f(x)=\begin{cases} \_\_\_\_\_ & \_\_\_\_\_ \\ \_\_\_\_\_ & \_\_\_\_\_ \\ \_\_\_\_\_ & \_\_\_\_\_ \end{cases}$$