4.2

Points, Graphs, and Equations

You will need:

graph paper

PATTERNS FROM POINTS

1. a. Draw a pair of axes and plot these points.

x	y
0	-1
-2	-3
-5	-6
5	4

b. Study the table and your graph. Describe the relationship between the x-value and y-value of each pair.

c. Use the pattern you found to add more points to your table and graph.

d. Write an equation that tells how to get the y-value from the x-value.

2. Repeat problem 1 for each of these tables.

a.

x	y
4	-8
1	-2
-3	6
0	0

b.

x	y
-3	-3
5	-3
-6	-3
-1	-3

c. ♀

x	y
6	4
12	-2
-1	11
3	7

GRAPHS FROM PATTERNS

3. For each description below, make a table of at least five (x, y) pairs that fit it. Then graph the (x, y) pairs. Use a separate coordinate system for each graph.

a. The y-coordinate is always equal to the x-coordinate.

b. The y-coordinate is always four less than the x-coordinate.

c. The y-coordinate is always one-half of the x-coordinate.

d. The y-coordinate is always the opposite of the x-coordinate.

e. The y-coordinate is always the square of the x-coordinate.

EQUATIONS FROM PATTERNS

4. For each description in problem 3, find an equation that describes the relationship between x and y. Write the equations on your graphs.

5. a. Make a table of four number pairs (x, y) that have this property: The sum of x and y is always 6.

b. Graph these (x, y) pairs.

c. Connect the points with a straight line.

d. Write the relationship between x and y as an equation.

6. a. Using fractions and negative numbers, write two more (x, y) pairs having the property that the sum of x and y is 6. Do these points lie on the line?

b. Choose a point that is not on the line. Do its (x, y) coordinates add up to 6?

c. Write any number pair (x, y) whose sum is not 6. Find this point. Is it on the line you drew?

On each graph below, four points are labeled. For each graph:

a. Make a table of the (x, y) pairs and look for a relationship between x and y.

b. Add three more points to the table, making sure each one does belong on the graph.

c. Write an equation describing the relationship between x and y.

7.

8.

9.

10.
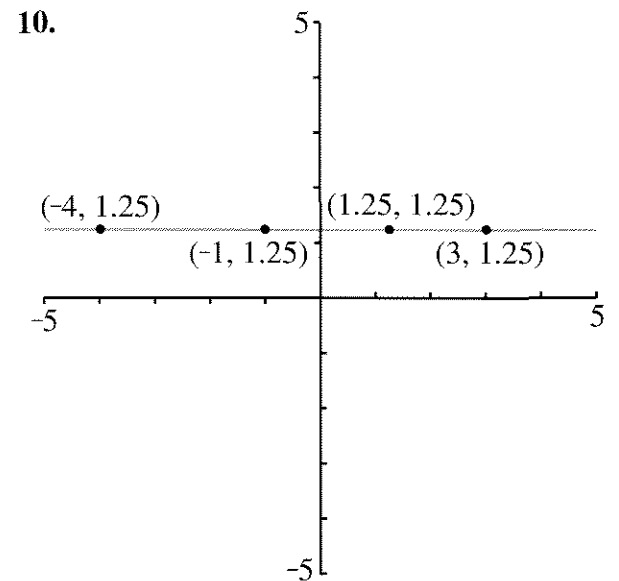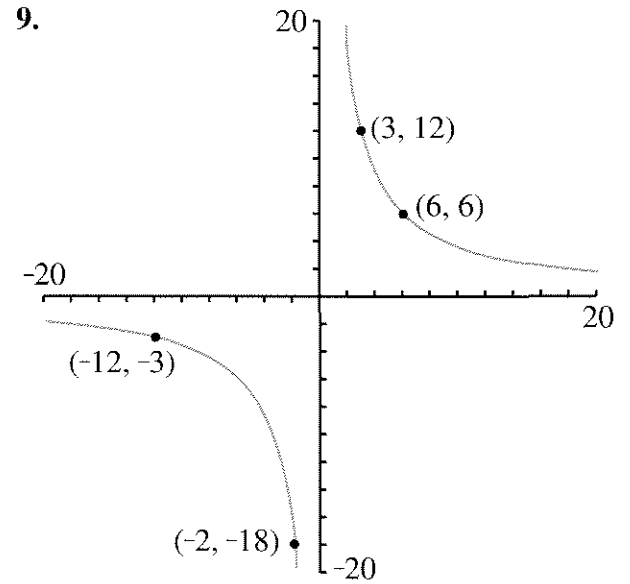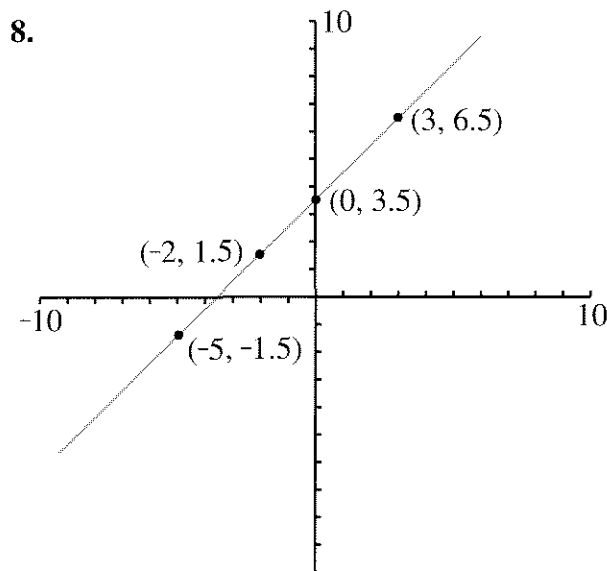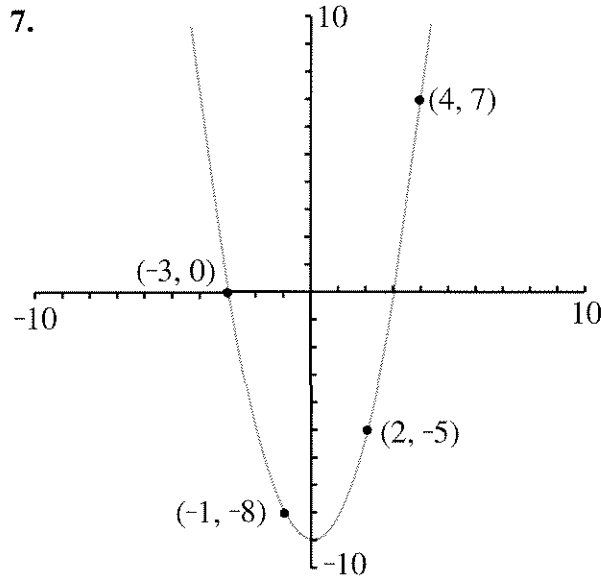
POINTS AND EQUATIONS

The following questions are about the graph of the function $y = 4x + 5$. Try to answer the questions without graphing.

11. ☞ Is the point $(7, 32)$ on it? Explain.

12. ☞ The point $(3, y)$ is on it. What is y? Explain.

13. ☞ The point $(x, 6)$ is on it. What is x? Explain.