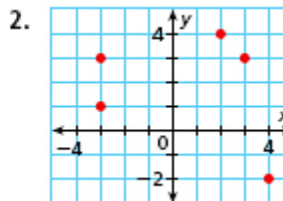


**1.2.1 Relations and Functions**

Give the domain and range for each relation.

1. **Basketball Points Scored**

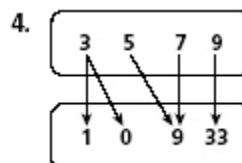
Player	Irene	Anna	Lea	Kate
Points	22	12	16	12



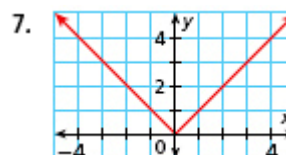
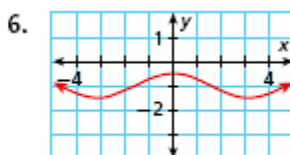
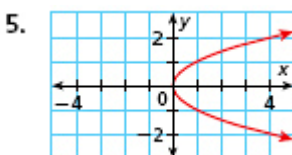
Determine whether each relation is a function.

3. **Women's Glove Sizes**

Size	S	M	L
Maximum Hand Length (in.)	6.5	7.5	8.5



Use the vertical-line test to determine whether each relation is a function. If not, identify two points a vertical line would pass through.



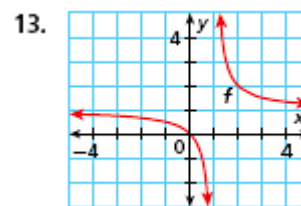
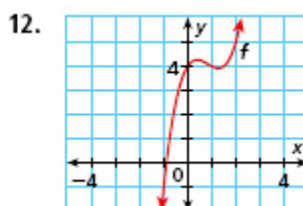
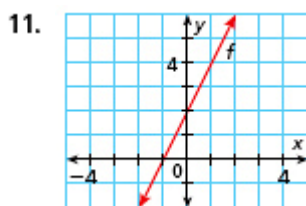
**1.2.2 Function Notation**

For each function, evaluate  $f(0)$ ,  $f\left(\frac{3}{2}\right)$ , and  $f(-1)$ .

8.  $f(x) = 7x - 4$

9.  $f(x) = -x^2 + x$

10.  $f(x) = -2x^2 + 1$



Graph each function.

14.

2003 Federal Income Tax Rates					
Income (\$)	25,000	50,000	75,000	100,000	150,000
Tax Rate (%)	15	25	28	28	33

15.  $f(x) = \sqrt{x}$  for  $x \geq 0$

16.  $f(x) = \frac{1}{2}x + 1$  for  $-6 < x < 6$

## Foundations for Functions

## Introduction to Functions

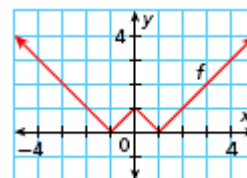
17. **Safety** In a certain county, the fines for speeding in a school zone are \$160 plus an additional \$4 for every mile per hour over the speed limit. Write a function to represent the speeding fines. What is the value of the function for an input of 8, and what does it represent?

### 1.2.3 Exploring Transformations

Perform the given translation on  $(3, 1)$ . Give the coordinates of the translated point.

18. 2 units right                      19. 4 units up                      20. 5 units left, 4 units down

Use a table to perform each transformation of  $y = f(x)$ . Use the same coordinate plane as the original function.



21. translation 2 units down                      22. reflection across the  $x$ -axis
23. translation 3 units right                      24. reflection across the  $y$ -axis
25. vertical compression by a factor of  $\frac{2}{3}$                       26. horizontal compression by a factor of  $\frac{1}{2}$

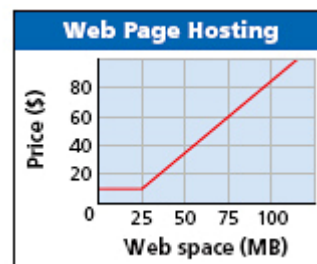
## Foundations for Functions

## Introduction to Functions

27. horizontal stretch by a factor of  $\frac{3}{2}$

28. vertical stretch by a factor of 2

**Technology** The graph shows the cost of Web page hosting depending on the Web space used. Sketch a graph to represent each situation and identify the transformation of the original graph that it represents.



29. The prices are reduced by \$5.

30. The prices are discounted by 25%.

31. A special is offered for double the amount of Web space for the same price.

**1.2.4 Introduction to Parent Functions**

Identify the parent function for  $g$  from its function rule. Then graph  $g$  on your calculator and describe what transformation of the parent function it represents.

32.  $g(x) = x^2 - 1$

33.  $g(x) = \sqrt{x - 2}$

34.  $g(x) = x^3 + 3$

Graph the data from the table. Describe the parent function and the transformation that best approximates the data set.

35.

$x$	-3	-1	0	1	3
$y$	3	$\frac{1}{3}$	0	$\frac{1}{3}$	3

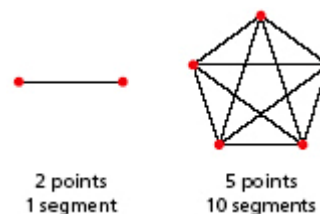
36.

$x$	0	1	4	9	16
$y$	0	2	4	6	8

37. **Geometry** The number of segments required to connect a given number of points is shown in the table.

- a. Graph the relationship from the number of points to the number of segments.

Connecting Points				
Number of Points	2	5	8	11
Number of Segments	1	10	28	55



- b. Identify which parent function best describes the data.

## Foundations for Functions

## Introduction to Functions

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- c. Use your graph to estimate the number of points if there are 45 segments.
- d. Use your graph to estimate the number of segments if there are 7 points.