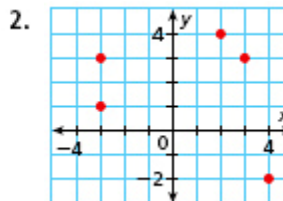


1.2.1 Relations and Functions

Give the domain and range for each relation.

1. **Basketball Points Scored**

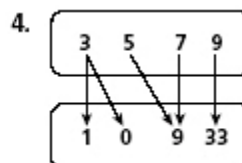
Player	Irene	Anna	Lea	Kate
Points	22	12	16	12



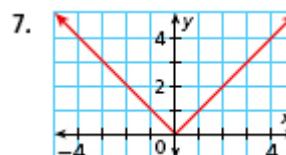
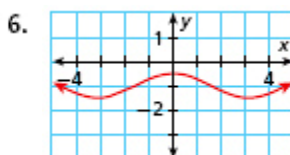
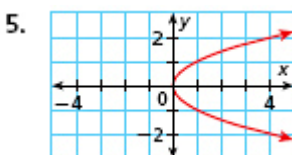
Determine whether each relation is a function.

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.



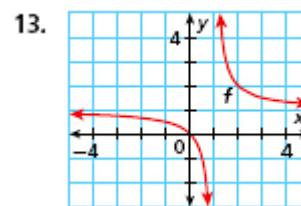
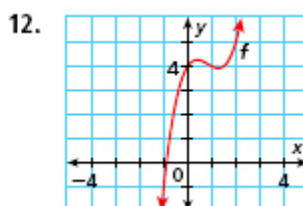
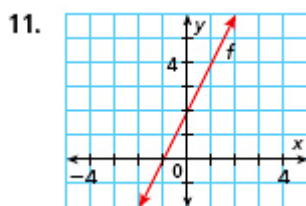
1.2.2 Function Notation

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

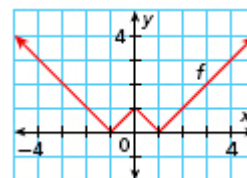
17. **Safety** In a certain county, the fines for speeding in a school zone are \$160 plus an additional \$4 for every mile per hour over the speed limit. Write a function to represent the speeding fines. What is the value of the function for an input of 8, and what does it represent?

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 $\frac{1}{2}$

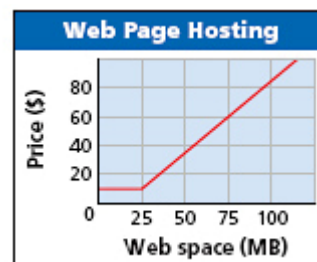
Foundations for Functions

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

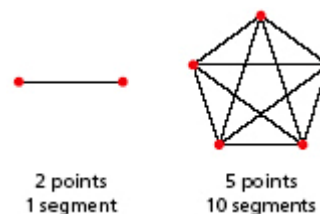
36.

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.