

Definition of a function

Determine whether each relation is a function.

1.

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

2.

x	g(x)
-2	-2
3	4
4	3
2.3	1
-1	0

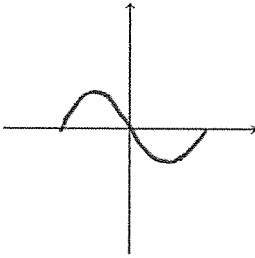
3.

x	f(x)
5.1	-4
2	1
-3	2
2	3
4	2.3

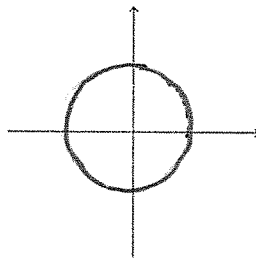
4. $\{(1,4), (1,-2), (1,0)\}$

5. $\{(2,-0.23), (2.1,-0.2), (-2,-2), (2.21,-0.2)\}$

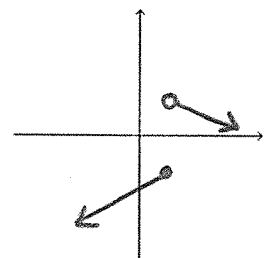
6.



7.



8.



9. Suppose f is a function. Which of the following is not possible. Explain.

f has multiple x -intercepts.

f has multiple y -intercepts.

Finding domain and range

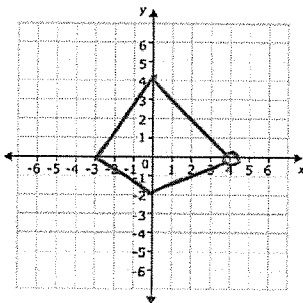
Find the domain and range of each relation.

10.

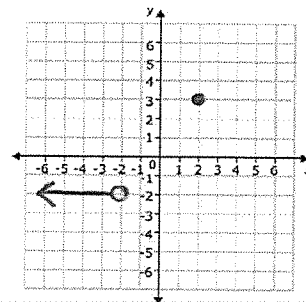
x	y
-1	-2
4	-2
6	0

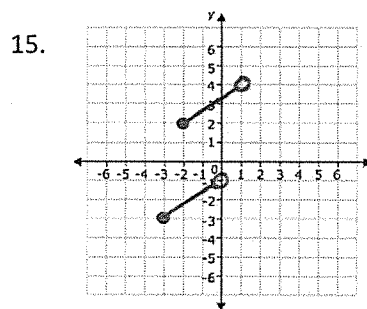
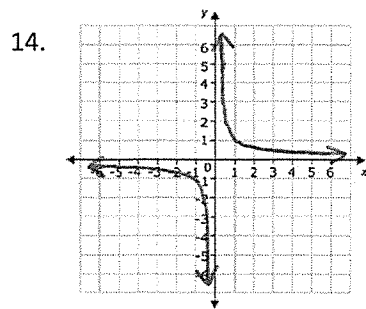
11. $\{(1.7,2), (2,1.7), (3,-1)\}$

12.



13.

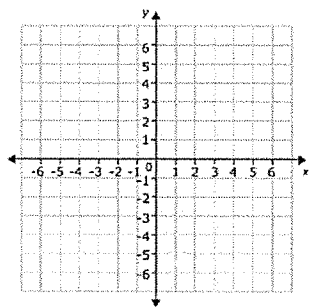




Draw functions that have the following domains and ranges.

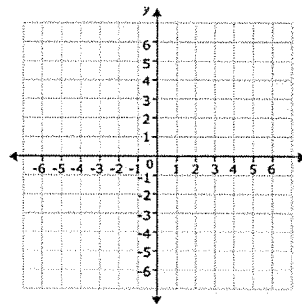
16. Domain: $(-\infty, 4]$

Range: $(0, 3]$



17. Domain: $[-2, 1] \cup (1, 3)$

Range: $\{-1, 2\}$



Forms for the equation of a line

Find the equation for each line described below in slope-intercept form.

18. The line with a slope of -2 and a y -intercept of $(0, 1)$.

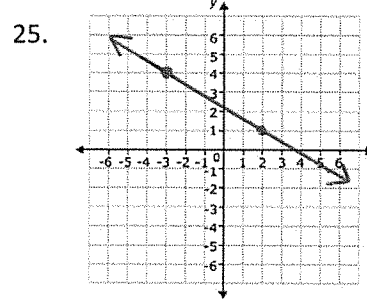
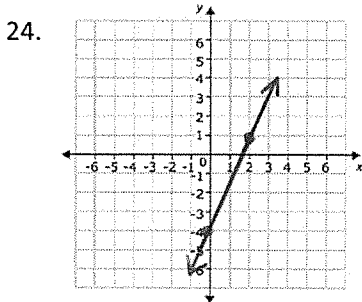
19. The line that passes through the points $(3, 3)$ and $(0, 4)$.

20. The line that passes through the points $(-1, -2)$ and $(4, 3)$.

21. The x -axis.

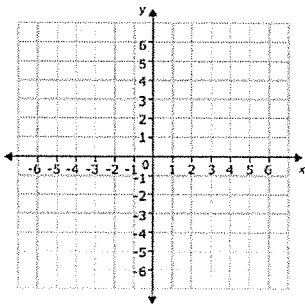
22. The line that is parallel to $y = x$ and passes through the point $(4, -1)$.

23. The line that is perpendicular to $3x - 2y = 1$ and passes through the origin.

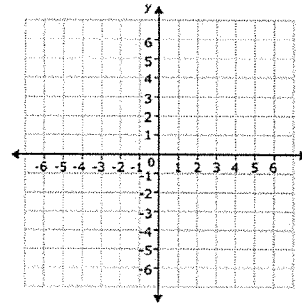


Graph each line.

26. $2x - 3y = 6$



27. $2x = 3x - 1$



Determine whether the following pairs of lines are parallel, perpendicular or neither.

28. $x = 2y$

$y = 2x$

29. $y - 3x = 4$

$y + 1 = 3(x + 2)$

Systems of linear equations

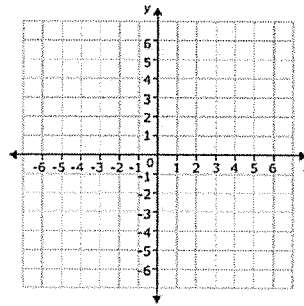
Solve each system. #33 must be solved by graphing.

30.
$$\begin{cases} y = 2x + 4 \\ x - y = 7 \end{cases}$$

31.
$$\begin{cases} 2x + 3y = 4 \\ 4x - 3y = 8 \end{cases}$$

$$32. \begin{cases} -x + 5x = -3 \\ 3x - 10y = 4 \end{cases}$$

$$33. \begin{cases} y = -|x - 1| + 2 \\ y = (x - 1)^2 \end{cases}$$



Linear inequalities (unions and intersections)

Determine whether the given point is a solutions to the system of inequalities.

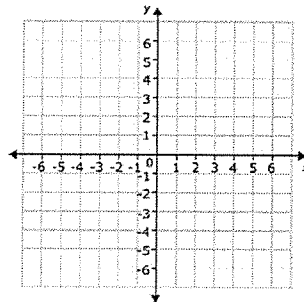
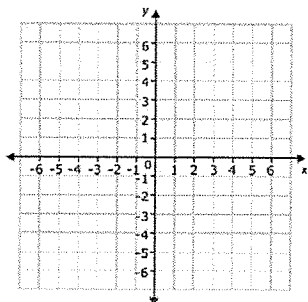
$$34. (2, -1); \begin{cases} y < -2x + 1 \\ x > 2 \end{cases}$$

$$35. (1, 3); \begin{cases} x - y^2 < -3x \\ x + y \geq 5 - x \end{cases}$$

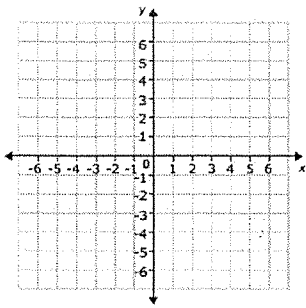
Graph each system of inequalities.

$$36. \begin{cases} y > -\frac{1}{2}x - 2 \\ x \leq 0 \end{cases}$$

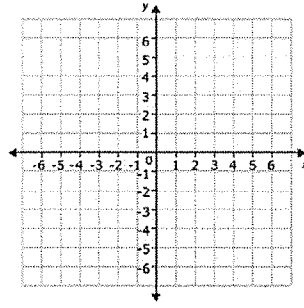
$$37. \begin{cases} y \leq -2 \\ 2x - 3y < 6 \end{cases}$$



$$38. \begin{cases} |x| \geq 6 \\ y \leq -x \end{cases}$$

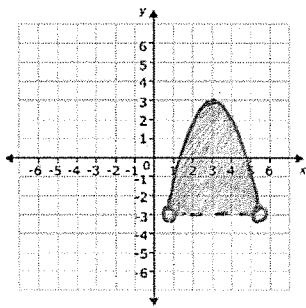


$$39. \begin{cases} y < 2^x \\ y > -2^x \end{cases}$$

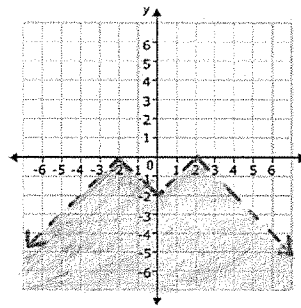


Determine what system of inequalities are given on each graph.

40.

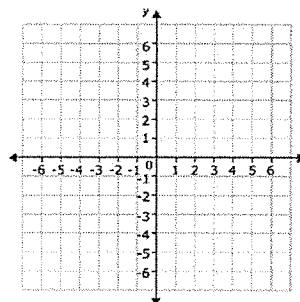
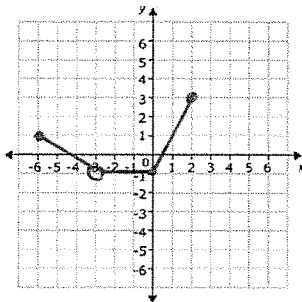


41.



Vertical and horizontal shifts

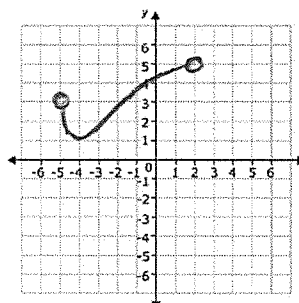
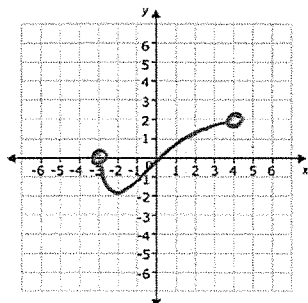
42. The graph of $g(x)$ is given in the graph on the left. Use it to graph the function $g(x - 3) - 2$ on the right.



43. Suppose the points $(4,0)$ and $(2,2)$ are on the function $f(x)$. What two points must lie on the graph of $f(x + 2) - 1$?

44. The function $h(x)$, has a domain of $(-\infty, 2)$ and a range of $[-1, 1]$. What are the domain and range of the function $h(x + 3) - 5$?

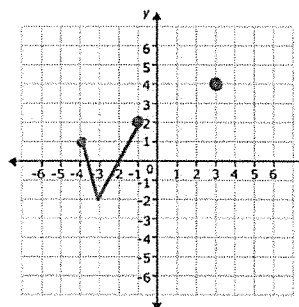
45. The graph of $k(x)$ is given in the graph on the left. What function has been drawn on the right?



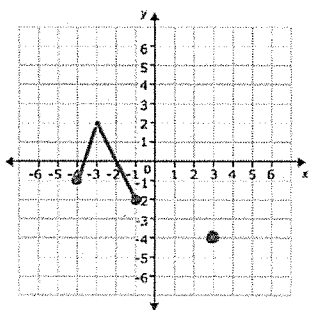
Vertical and horizontal reflections

The graph of $f(x)$ is given to the right.

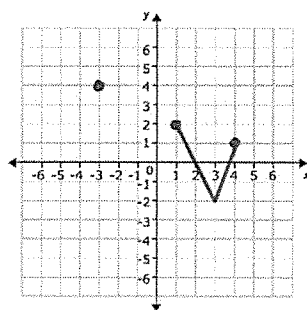
Use it to determine which functions have been graphed below.



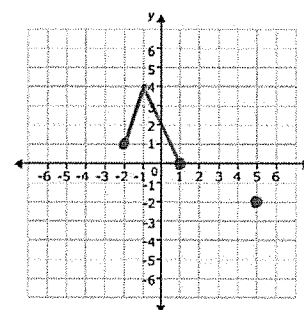
46.



47.



48.



49. Suppose the point $(2, -1)$ lies on the function $f(x)$. What point must lie on the graph of $f(-x) + 2$?

50. Suppose the point $(1, 3)$ lies on the function $f(x)$. What point must lie on the graph of $-f(x - 1)$?

51. The function $h(x)$, has a domain of $(0, \infty)$ and a range of $\{2\}$. What are the domain and range of the function $-h(-x) - 2$?

Vertical stretches and compressions

52. $y = 2^{-x+1}$

Parent function: _____

Shifts: _____

Reflections: _____

Stretches/Shrinks: _____

54. $y = 2(x + 3)^2 + 1$

Parent function: _____

Shifts: _____

Reflections: _____

Stretches/Shrinks: _____

53. $y = -\frac{2}{3}|x - 2|$

Parent function: _____

Shifts: _____

Reflections: _____

Stretches/Shrinks: _____

55. $y = -\sqrt{-x} + 6$

Parent function: _____

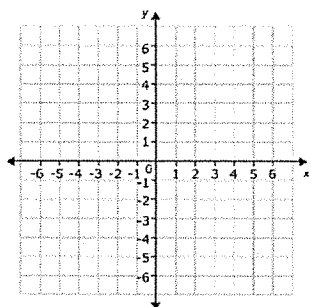
Shifts: _____

Reflections: _____

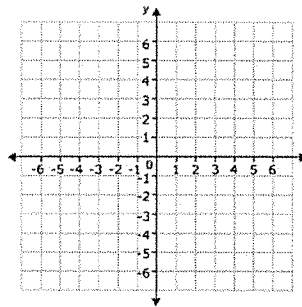
Stretches/Shrinks: _____

Graph each function.

56. $f(x) = -\frac{1}{3}|x + 1|$

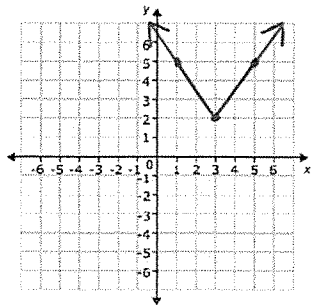


57. $f(x) = 2x^2 - 4$

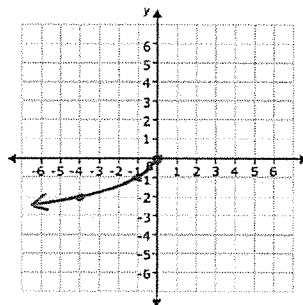


What functions are graphed below?

58.



59.



60. Give an expressions that represents the square root function stretched vertically by a factor of 3, reflected horizontally, and shifted down 2 units.