

Shapes of Algebra

Linear functions

Absolute value functions

Piecewise functions

Step functions

Solving absolute value equations/inequalities

Finding absolute value vertex

Translations of linear/absolute value functions

Solving systems of equations

Graphing

Substitution

Elimination

Applications

Graphing inequalities

Linear Programming

1. Solve each absolute value equation or inequality.

a. $|2x - 5| + 4 = 9$

b. $|6x + 1| = -10$

c. $|x - 6| \geq 14$

d. $2|8x + 3| < 10$

2. Find the vertex of the absolute value function.

$$f(x) = |2x + 3| + 1$$

3. Describe the translation of the function $f(x) = |x|$

a. $f(x) = |x + 8|$

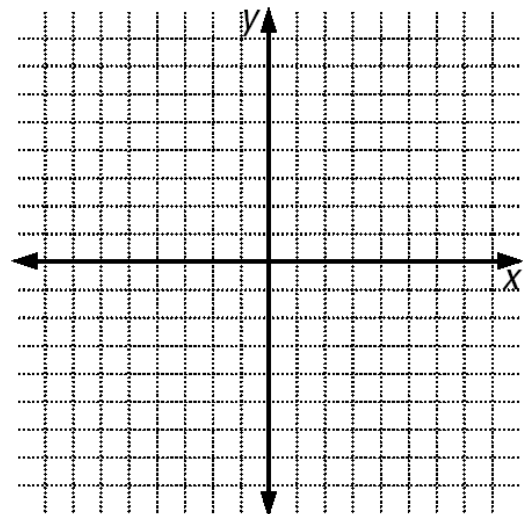
b. $f(x) = |x - 1| - 3$

4. Solve each system of equations using method given.

a. Substitution:
$$\begin{cases} y = -3x \\ 5x + 2y = 2 \end{cases}$$

b. Elimination:
$$\begin{cases} 3x + 2y = 9 \\ 2x + 4y = -2 \end{cases}$$

c. Graphing:
$$\begin{cases} y = x - 1 \\ 3x + 2y = -12 \end{cases}$$



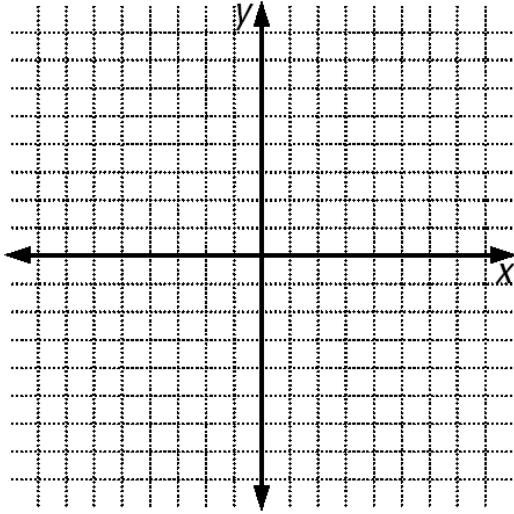
5. Without graphing, classify each system as *independent*, *dependent*, or *inconsistent*.

a.
$$\begin{cases} y = -2x + 5 \\ 4x + 2y = 5 \end{cases}$$

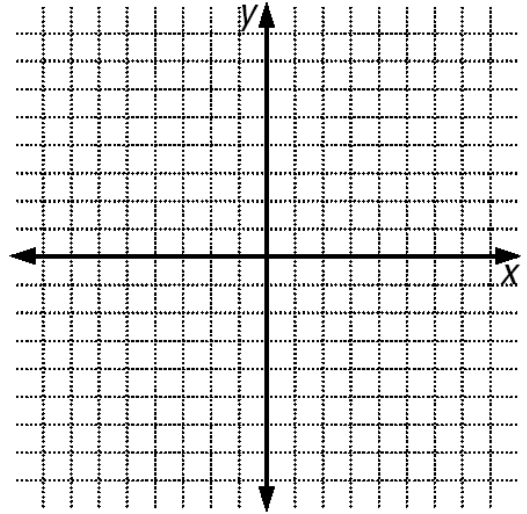
b.
$$\begin{cases} 2x + 7y = 12 \\ 4x + 14y = 24 \end{cases}$$

6. Graph each inequality.

a. $y < \frac{1}{3}x + 5$

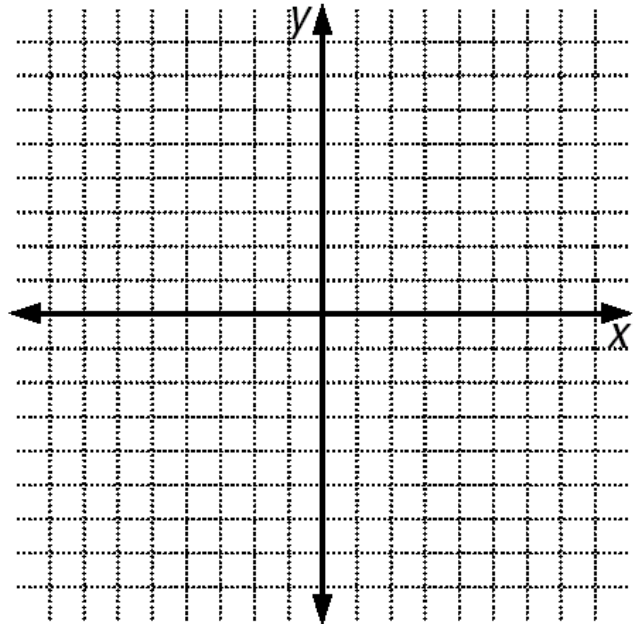


b. $4x + 2y \geq 12$

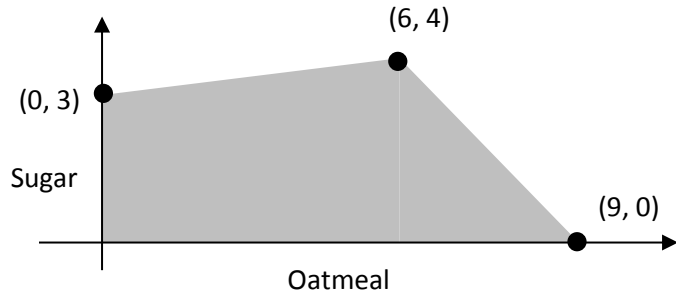


7. Graph the system of inequalities on the same set of axes.

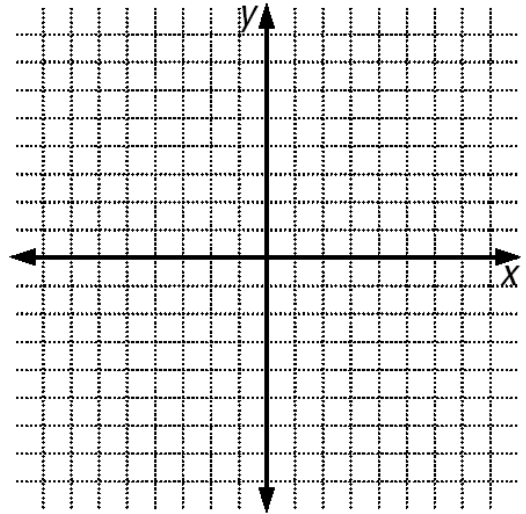
$$\begin{cases} y < \frac{1}{3}x + 5 \\ 4x + 2y \geq 12 \end{cases}$$



8. Tim makes a profit of \$4.00 on every dozen oatmeal cookies and \$2.00 on every dozen sugar cookies. What is his maximum profit? When does this occur?



9. a. Graph the function: $f(x) = \begin{cases} x + 6 & x < -4 \\ \frac{1}{2}x & x \geq -4 \end{cases}$



- b. Find each of the following:

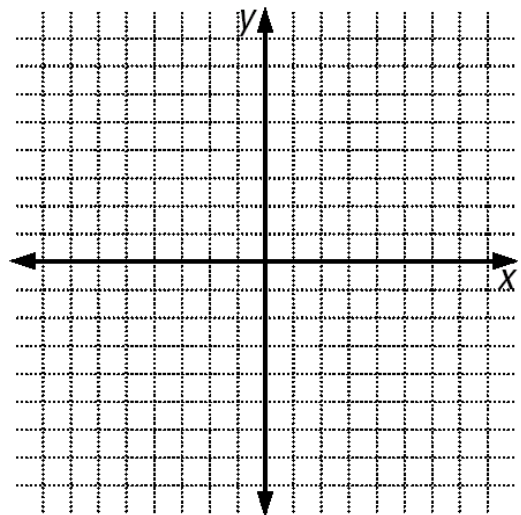
$$f(-6) =$$

$$f(0) =$$

$$f(40) =$$

$$f(-4) =$$

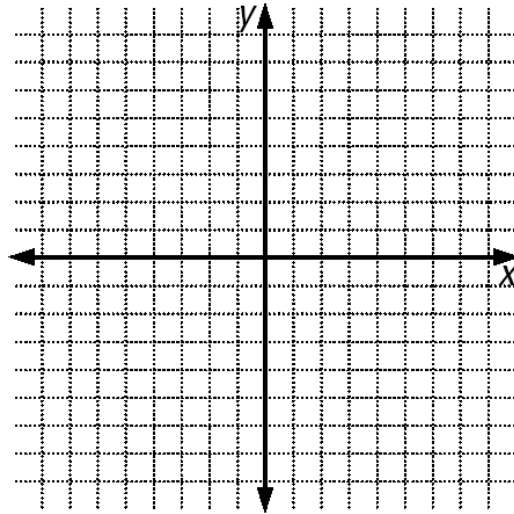
10. Graph the step function: $f(x) = 2[x - 3]$



11. Make a table of values for the equation. Then graph the equation.

$$y = -|x - 3| + 2$$

x	y

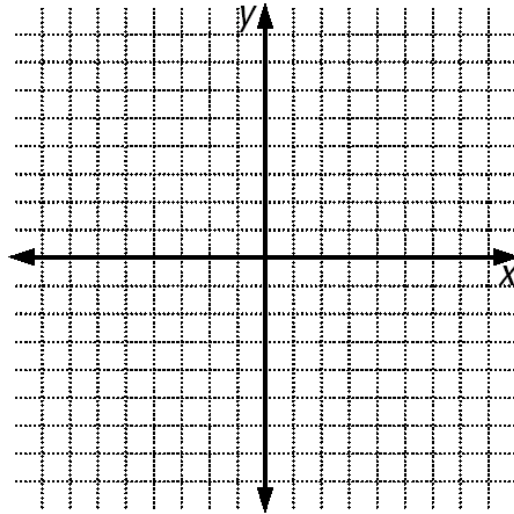


- Describe the end behavior of the graph.
- Find the rate of change as x goes from $-\infty$ to ∞ .
- On what interval of x is the function increasing? Decreasing? Use Interval Notation.
- Find any extreme values (relative maximum or relative minimum).
- Find the domain and range of the function.

12. Make a table of values for the equation. Then graph the equation.

$$y = -\frac{3}{4}x + 2$$

x	y



- Describe the end behavior of the graph.
- Find the rate of change as x goes from $-\infty$ to ∞ .
- On what interval of x is the function increasing? Decreasing? Use Interval Notation.
- Find any extreme values (relative maximum or relative minimum).
- Find the domain and range of the function.