

Graph the equation in a coordinate plane.

1. $y = 4x$

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

3. $x + y = 5$

4. $y = 3$

5. $2x + 5y = 11$

6. $y = -2x - 2$

Warm Up

Write the next three terms of the arithmetic sequence.

1. First term: 3

Common difference: 12

2. First term: 19

Common difference: -7

Cumulative Warm Up

Essential Question

How can you use a system of linear equations to solve an equation with variables on both sides?

Essential Question

* Use a Coordinate grid to graph

* begin with y-intercept and then count out slope.

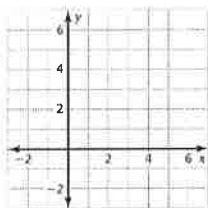
Skip Sequences.

What you will learn:

- Solve linear equations by graphing
- Solve absolute value equations by graphing
- Use linear equations to solve real-life problems.

Work with a partner. Solve $2x - 1 = -\frac{1}{2}x + 4$ by graphing.

a. Use the left side to write a linear equation. Then use the right side to write another linear equation.



b. Graph the two linear equations from part (a). Find the x -value of the point of intersection. Check that the x -value is the solution of $2x - 1 = -\frac{1}{2}x + 4$.

c. Explain why this "graphical method" works.

Exploration 1

* write each side of equation as its own equation

$$y = 2x - 1$$

$$y = -\frac{1}{2}x + 4$$

then graph

Work with a partner. Solve each equation using two methods.

Method 1 Use an algebraic method.

Method 2 Use a graphical method.

Is the solution the same using both methods?

a. $\frac{1}{2}x + 4 = -\frac{1}{4}x + 1$

b. $\frac{2}{3}x + 4 = \frac{1}{3}x + 3$

c. $-\frac{2}{3}x - 1 = \frac{1}{3}x - 4$

d. $\frac{4}{5}x + \frac{7}{5} = 3x - 3$

e. $-x + 2.5 = 2x - 0.5$

f. $-3x + 1.5 = x + 1.5$

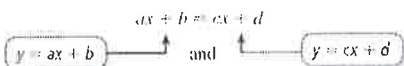
Exploration 2

* Student practice

Core Concept

Solving Linear Equations by Graphing

Step 1 To solve the equation $ax + b = cx + d$, write two linear equations.



Step 2 Graph the system of linear equations. The x -value of the solution of the system of linear equations is the solution of the equation $ax + b = cx + d$.

Core Concept

Solve $-x + 1 = 2x - 5$ by graphing. Check your solution.

$$y = -x + 1$$

$$y = 2x - 5$$

Example 1

Solve the equation by graphing. Check your solution.

1. $\frac{1}{2}x - 3 = 2x$

2. $-4 + 9x = -3x + 2$

Monitoring Progress 1-2

Solve $|x+1| = |2x-4|$ by graphing. Check your solutions.

$$x+1 = 2x-4 \quad y = x+1$$

$$x+1 = -(2x-4) \quad y = 2x-4$$

$$x+1 = -2x+4 \quad y = x+1$$

$$x+1 = -2x+4 \quad y = -2x+4$$

* Always check solutions

Example 2

* graph both lines

* Intersecting point is the solution

* Remember you are solving for x.

* Student practice

$|ax+b| = |cx+d|$ has 2 related equations

$$ax+b = cx+d$$

$$ax+b = -(cx+d)$$

Graph first two equations on one grid

Graph 2nd two equations on a 2nd grid

Solve the equation by graphing. Check your solutions.

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

$$2x+2 = x-2$$

$$2x+2 = -(x-2) \text{ or}$$

$$2x+2 = -x+2$$

4. $|x-6|=|-x+4|$

$$x-6 = -x+4$$

$$x-6 = -(-x+4)$$

$$x-6 = x-4$$

Monitoring Progress 3-4

Your family needs to rent a car for a week while on vacation. Company A charges \$3.25 per mile plus a flat fee of \$125 per week. Company B charges \$3 per mile plus a flat fee of \$150 per week. After how many miles of travel are the total costs the same at both companies?

$$3.25x + 125 = 3x + 150$$

$$y = 3.25x + 125$$

$$y = 3x + 150$$

Example 3

5. WHAT IF? Company C charges \$3.30 per mile plus a flat fee of \$115 per week. After how many miles are the total costs the same at Company A and Company C?

make adjustments for the what if.

Monitoring Progress 5

Exit Ticket:

Solve the equation $3x - 4 = \frac{1}{2}x + 1$ by graphing. Check your solution.

Closure

