

INDEPENDENT VARIABLE

IDV WORKSHEETS



SOLVING SYSTEMS BY GRAPHING

WHERE THE LINES CROSS | ONE, NONE OR INFINITELY MANY

ANIMATED
POWERPOINT:
DOES THE WORK
FOR YOU!

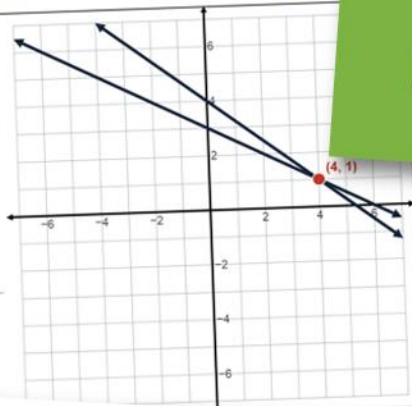
FULL ANSWER
KEYS
INCLUDED

GUIDED PROBLEM 1 • PART 1: GRAPH AND SOLVE

Graph this system of equations and find the solution.

$$y = -\frac{3}{4}x + 4$$
$$y = -\frac{1}{2}x + 3$$

Solution: (4, 1)

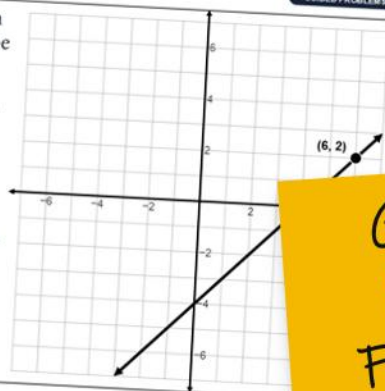


PART 2 • GUIDED PROBLEM 7 • PART 2: BUILD A SYSTEM

7. The solution is (6, 2). One equation is graphed. Select ALL that could be the other equation.

- A) $y = -3x$ B) $y = -\frac{3}{2}x + 6$
C) $y = -\frac{1}{6}x + 3$ D) $y = \frac{2}{3}x - 1$
E) $y = \frac{1}{2}x - 1$

C, E: each passes through (6, 2).



11 EXAMPLE
PROBLEMS
3 PRACTICE
SHEETS

GRAPH &
SOLVE +
FIND THE
MISTAKE

MORE PRACTICE. LESS PREP. BETTER OUTCOMES.

Inside the Animated Lesson

INDEPENDENT VARIABLE

GRADE 8 • SYSTEMS OF EQUATIONS

SOLVING SYSTEMS BY GRAPHING

WHERE THE LINES CROSS | ONE, NONE OR INFINITELY MANY

Animated PowerPoint lesson
11 guided problems from graph to reasoning
Practice, Find the Mistake, exit tickets

MORE PRACTICE, LESS PREP, BETTER OUTCOMES.
idworksheets.com

LESSON OVERVIEW

Today's Goals

I CAN...

- Solve a system by graphing both lines and finding where they cross.
- Explain why some solutions can only be estimated from a graph.
- Write and pick equations that make a system have one, no or infinitely many solutions.

KEY VOCABULARY

System of equations two equations about the same x and y	Solution the point that works in both
Intersection where the lines cross	Parallel lines same slope, never cross
Estimate a close guess from the graph	Infinitely many the same line: every point works

STANDARDS
CCSS 8.EE.C.8a CCSS 8.EE.C.8b CCSS 8.EE.C.8c

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PART 1 • NOTES

The Solution Is Where They Cross

NOTES • PART 1: GRAPH AND SOLVE

The solution of a system is the point where the two lines **cross**.

It makes **both** equations true: check it in each one.

If the lines cross between grid lines, the graph can only **estimate** the solution.

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PART 1 • GUIDED PROBLEM 1 • PART 1: GRAPH AND SOLVE

1. Graph this system of equations and find the solution.

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

$$y = -\frac{1}{2}x + 3$$

Solution: (4, 1)

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PART 1 • GUIDED PROBLEM 2 • PART 1: GRAPH AND SOLVE

2. a. Graph the system and estimate the solution. b. Explain why graphing does not give the exact answer here.

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

$$y = -x + 3$$

a. **About (1.6, 1.4)**

b. **They cross between grid lines, so a graph can only estimate it.**

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PART 2 • NOTES

One, None or Infinitely Many

NOTES • PART 2: BUILD A SYSTEM

Different slopes: the lines cross once, so there is exactly **one** solution.

Same slope, different y-intercepts: **parallel** lines, so there is **no** solution.

The same line: every point works, so there are **infinitely many** solutions.

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PART 2 • GUIDED PROBLEM 6 • PART 2: BUILD A SYSTEM

6. Here is the graph of one equation in a system. Write a second equation so the system has (a) infinitely many solutions, (b) no solution, (c) exactly one solution.

a. $y = -3/4x + 4$

b. $y = -3/4x + 1$

c. $y = 2x + 4$

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PART 2 • GUIDED PROBLEM 11 • PART 2: BUILD A SYSTEM

11. Match each graph to its system.

A) $y = 3x + 5$ and $y = -2x + 20$
B) $y = 2x - 10$ and $y = 4x - 1$
C) $y = 0.5x + 12$ and $y = 2x + 27$

Graph 1

Graph 2

Graph 3

Graph 1: C Graph 2: A Graph 3: B

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Directions: Fill in the notes. Then work each problem with the slides.

PART 1 • NOTES

The solution of a system is the point where the two lines _____.

It makes _____ equations true: check it in each one.

If the lines cross between grid lines, the graph can only _____ the solution.

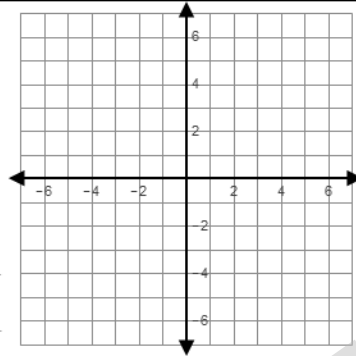
GUIDED PROBLEMS

1. Graph this system of equations and find the solution.

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

$$y = -\frac{1}{2}x + 3$$

Solution: _____

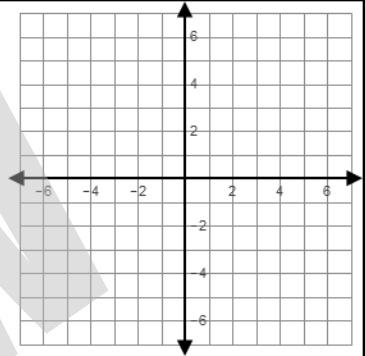


2. a. Graph the system and estimate the solution. b. Explain why graphing does not give the exact answer here.

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

$$y = -x + 3$$

- a. _____
- b. _____



3. Choose the two equations that make up the system shown. Then estimate the solution.

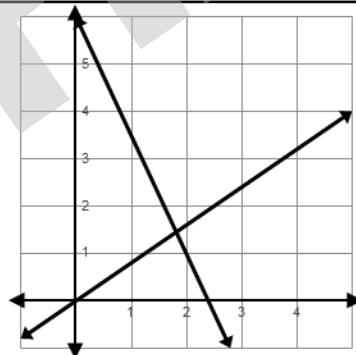
A) $y = -\frac{5}{2}x + 6$

B) $y = \frac{5}{2}x + 6$

C) $y = -3x + 6$

D) $y = \frac{4}{5}x$

Estimate: _____



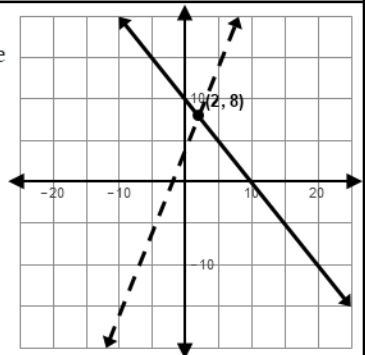
4. Use the lines to decide whether each statement is true or false. Solid: $y = -x + 10$. Dashed: $y = 2x + 4$.

A) A solution to $8 = -x + 10$ is 2. T F

B) A solution to $2 = 2x + 4$ is 8. T F

C) A solution to $-x + 10 = 2x + 4$ is 8. T F

D) A solution to $-x + 10 = 2x + 4$ is 2. T F



Directions: Fill in the notes. Then work each problem with the slides.

PART 2 • NOTES

Different slopes: the lines cross once, so there is exactly _____ solution.

Same slope, different y-intercepts: _____ lines, so there is _____ solution.

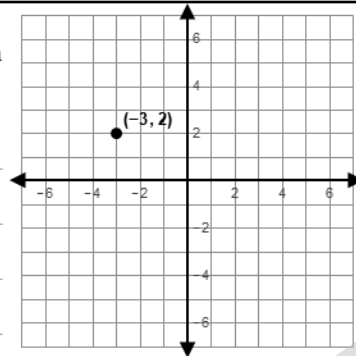
The same line: every point works, so there are _____ solutions.

GUIDED PROBLEMS

5. Write a system of two equations that has its solution at $(-3, 2)$.

$y =$ _____

$y =$ _____

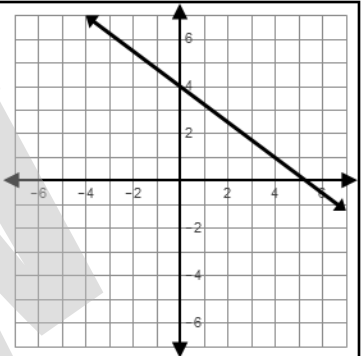


6. Here is the graph of one equation in a system. Write a second equation so the system has (a) infinitely many solutions, (b) no solution, (c) exactly one solution.

a. _____

b. _____

c. _____



7. The solution is $(6, 2)$. One equation is graphed. Select ALL that could be the other equation.

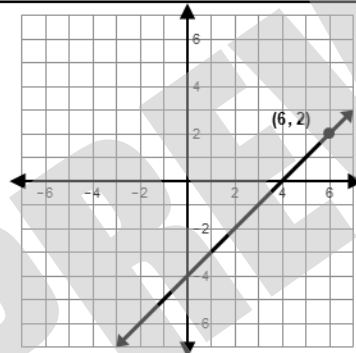
A) $y = -3x$

B) $y = -\frac{3}{2}x + 6$

C) $y = -\frac{1}{6}x + 3$

D) $y = \frac{2}{3}x - 1$

E) $y = \frac{1}{2}x - 1$



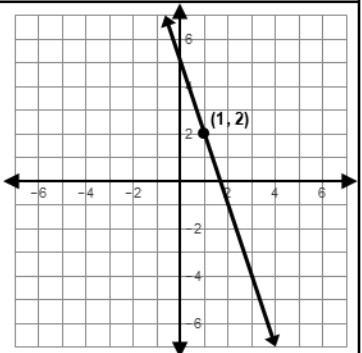
8. The solution is $(1, 2)$. One equation is graphed. Select ALL that could be the other equation.

A) $y = 2x$

B) $y = \frac{1}{3}x + 2$

C) $y = -x + 3$

D) $y = 3x - 1$



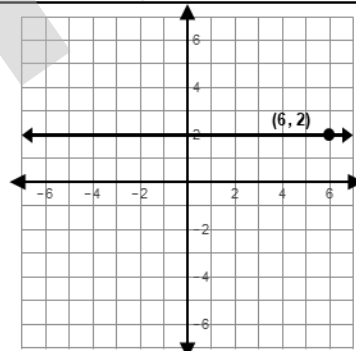
9. The solution is $(6, 2)$. One equation is graphed. Select ALL that could be the other equation.

A) $y = 4x + 2$

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

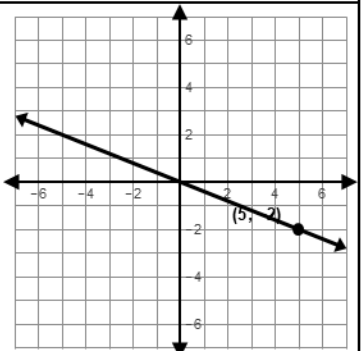
C) $y = -\frac{1}{6}x + 3$

D) $y = \frac{1}{2}x - 1$



10. The solution to the system is $(5, -2)$. Write and graph an equation that could be the other equation.

$y =$ _____

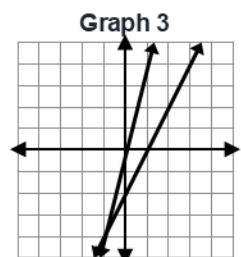
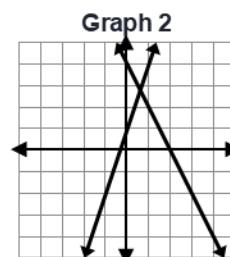
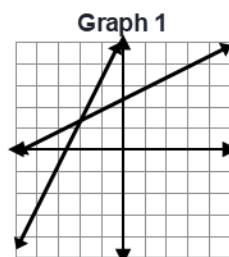


11. Match each graph to its system.

A) $y = 3x + 5$ and $y = -2x + 20$

B) $y = 2x - 10$ and $y = 4x - 1$

C) $y = 0.5x + 12$ and $y = 2x + 27$

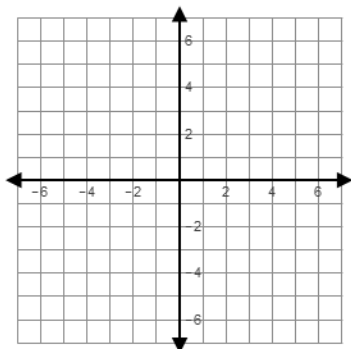


Directions: Graph both equations and find the solution. If the lines cross between grid lines, estimate.

1. Graph and find the solution.

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

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

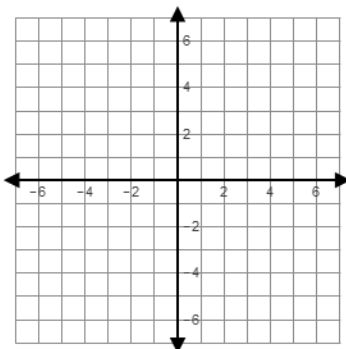


Solution:

2. Graph and find the solution.

$$y = x$$

$$y = \frac{1}{4}x + 3$$

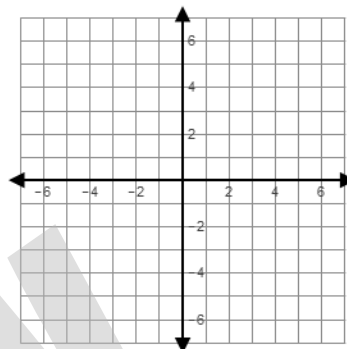


Solution:

3. Graph and find the solution.

$$y = -x - 3$$

$$y = 2x$$

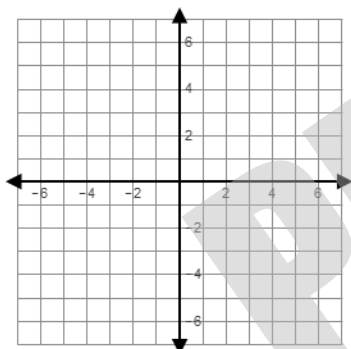


Solution:

4. Graph and find the solution.

$$y = x + 4$$

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

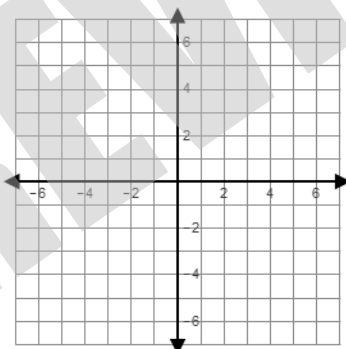


Solution:

5. Graph and find the solution.

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

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

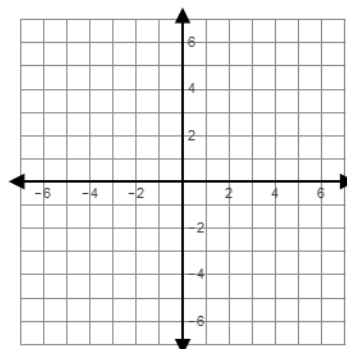


Solution:

6. Graph and find the solution.

$$y = x + 1$$

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

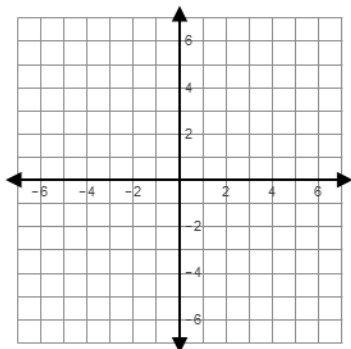


Solution:

7. Graph and find the solution.

$$y = -2x + 3$$

$$y = \frac{1}{5}x - 1$$

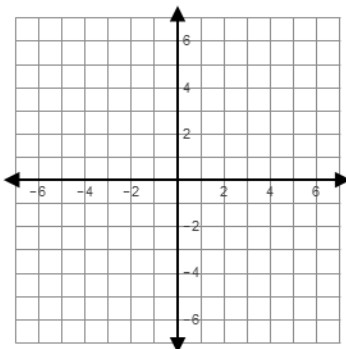


Solution:

8. Graph and find the solution.

$$y = 4$$

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

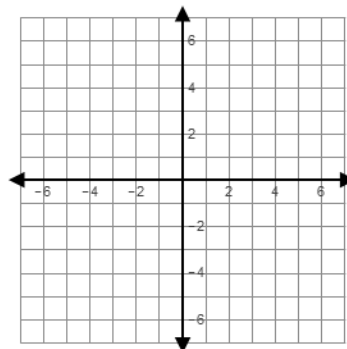


Solution:

9. Graph and find the solution.

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

$$x = -5$$

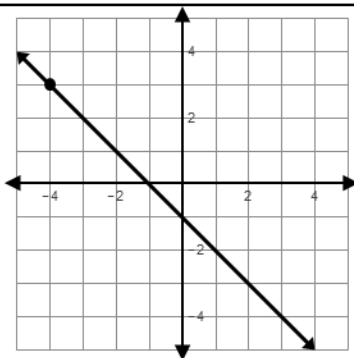


Solution:

Directions: Do what each problem asks. Use the graph.

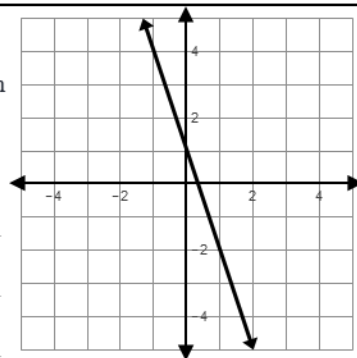
1. The solution to the system is $(-4, 3)$. One equation is graphed. Select all the equations that could be the other equation in the system.

- A) $y = -\frac{1}{4}x + 2$
 B) $y = -2x - 5$
 C) $y = \frac{1}{2}x + 5$
 D) $y = -2x + 2$



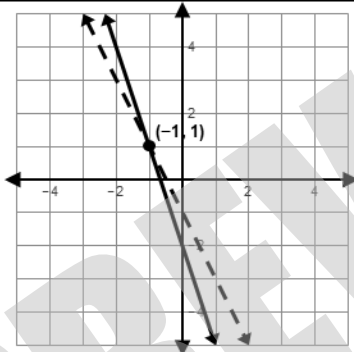
2. Here is the graph of one equation in a system. Write a second equation so the system has infinitely many solutions.

$y =$ _____



3. Use the graph. True or false?
 Solid: $y = -3x - 2$ Dashed: $y = -2x - 1$

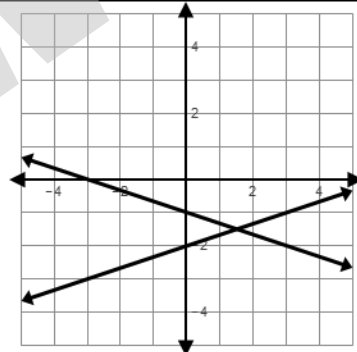
- A) A solution to $-3x - 2 = -2x - 1$ is 1. T F
 B) A solution to $1 = -3x - 2$ is -1 . T F
 C) A solution to $1 = -3x - 2$ is 1. T F
 D) A solution to $-3x - 2 = -2x - 1$ is -1 . T F



4. The graph shows a system. Choose its two equations. Then estimate the solution.

- A) $y = -\frac{1}{3}x - 1$
 B) $y = x - 2$
 C) $y = \frac{1}{3}x - 4$
 D) $y = \frac{1}{3}x - 2$

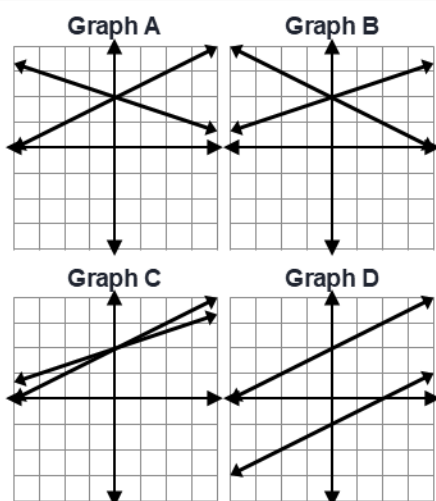
Estimate: _____



5. Which graph shows this system?

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

$$y = \frac{1}{3}x + 2$$



6. The solution to the system is $(0, 1)$. One equation is graphed. Select all the equations that could be the other equation in the system.

- A) $y = -2x + 1$
 B) $y = \frac{1}{3}x + 1$
 C) $y = -\frac{1}{4}x + 1$
 D) $y = -2x + 3$

