

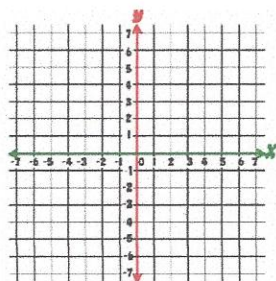
Graphing Systems of Linear Equations

Objective: By the end of today's lesson, I will be able to graph 3 systems of linear equations.

A system of linear equations is when we have two or more linear equations.

The BIG DEAL: Our job is to find out where the two lines intersect.

Exactly One Solution

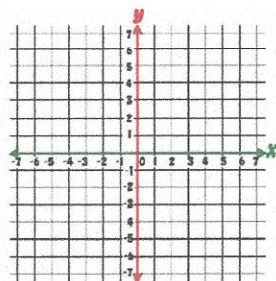


We say there is exactly ONE solution if the linear equations intersect at one point.

Ex. 1) $y = x - 4$
 $y = \frac{1}{3}x - 2$

The lines meet at (3,-1)

Infinitely Many Solutions

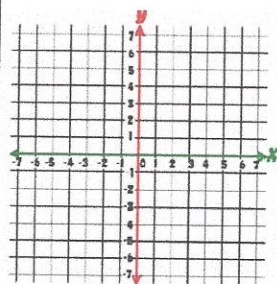


There are infinitely many solutions if the lines are on top of each other.

Ex. 2) $2x + 4y = 2$
 $3x + 6y = 3$

The lines both represent $y = -\frac{1}{2}x + \frac{1}{2}$ so they lie atop one another, meaning there are infinitely many solutions.

No Solution

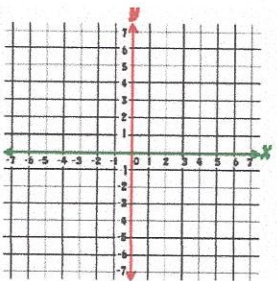


If the lines never intersect, then there is no solution.

Ex. 3) $x + y = 4$
 $x + y = 1$

These lines never cross at any point, because they have the same slope, so there is no solution.

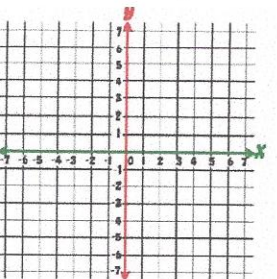
We Should Try One Together!



Ex. 4) Graph each system of solutions. Determine whether there is one solution, infinitely many solutions, or no solution. If there is one solution, name it.

$y = -x - 2$
 $y = 2x - 4$

Try Another One!



Ex. 5) Graph each system of solutions. Determine whether there is one solution, infinitely many solutions, or no solution. If there is one solution, name it.

$2y - 4x = 2$
 $y = 2x - 4$

3 Practice

Formative Assessment

Use Exercises 1–9 to check for understanding.

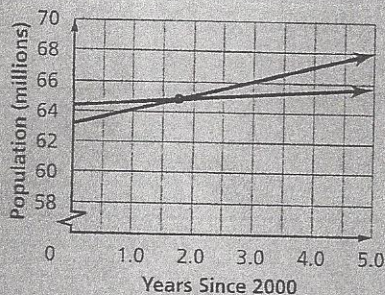
Use the chart at the bottom of the next page to customize assignments for your students.

Odd/Even Assignments

Exercises 10–31 are structured so that students practice the same concepts whether they are assigned odd or even problems.

Additional Answer

39.



The solution (1.75, 65) means that 1.75 years after 2000, or in 2002, the population of the West and the Midwest were approximately equal, 65 million.

Example 2 (p. 254) Graph each system of equations. Then determine whether the system has *no solution*, *one solution*, or *infinitely many solutions*. If the system has one solution, name it. 5–8. See Ch. 5 Answer Appendix for graphs.

5. $y = 3x - 4$ one; (0, -4)

$y = -3x - 4$

6. $x + y = 2$ one; (-1, 3)

$y = 4x + 7$

7. $x + y = 4$ no solution

$x + y = 1$

8. $2x + 4y = 2$ infinitely many

$3x + 6y = 3$

Example 3 (p. 255) ★ 9. **GEOMETRY** The length of the rectangle is 1 meter less than twice its width. What are the dimensions of the rectangle? 13 m by 7 m

Perimeter = 40 m

Exercises

HOMEWORK

For Exercises	See Examples
10–15	1
16–27	2
28–31	3

Exercise Levels:

A: 10–31

B: 32–39

C: 40–43

12. infinitely many

13. no solution

Use the graph to determine whether each system has *no solution*, *one solution*, or *infinitely many solutions*.

10. $x = -3$

$y = 2x + 1$ one

11. $y = -x - 2$

$y = 2x - 4$ one

12. $y = 2x + 1$

$2y - 4x = 2$

13. $y = 2x + 1$

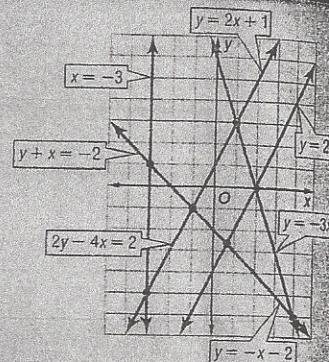
$y = 2x - 4$

14. $y + x = -2$

$y = -x - 2$
infinitely many

15. $2y - 4x = 2$

$y = 2x - 4$
no solutions



Graph each system of equations. Then determine whether the system has *no solution*, *one solution*, or *infinitely many solutions*. If the system has one solution, name it. 16–27. See Ch. 5 Answer Appendix for graphs.

16. $y = -6$ one; (2, -6)

$4x + y = 2$

17. $x = 2$ one; (2, -2)

$3x - y = 8$

18. $y = \frac{1}{2}x$ one; (4, 2)

$2x + y = 10$

19. $y = -x$ one; (2, -2)

$y = 2x - 6$

20. $y = 2x + 6$ one;

$y = -x - 3$ (-3, 0)

21. $x - 2y = 2$ one;

$3x + y = 6$ (2, 0)

22. $x + y = 2$ one; (-2, 4)

$2y - x = 10$

23. $3x + 2y = 12$ no

$3x + 2y = 6$ solution

24. $2x + 3y = 4$

$-4x - 6y = -8$

25. $2x + y = -4$ one;

$5x + 3y = -6$ (-6, 8)

26. $4x + 3y = 24$ one;

$5x - 8y = -17$ (3, 4)

27. $3x + y = 3$

$2y = -6x + 6$
infinitely many

SAVINGS For Exercises 28 and 29, use the following information.

Monica and Max Gordon each want to buy a scooter. Monica has already saved \$25 and plans to save \$5 per week until she can buy the scooter. Max has \$16 and plans to save \$8 per week.

28. In how many weeks will Monica and Max have saved the same amount of money? 3 weeks

29. How much will each person have saved at that time? \$40

DIFFERENTIATED HOMEWORK OPTIONS

Level	Assignment	Two-Day Option	
BL Basic	10–31, 41–51	9–31 odd, 44, 45	10–30 even, 41–43, 46–51
OL Core	9–33 odd, 34–39, 41–51	10–31, 44, 45	32–39, 41–51
AL Advanced /Pre-AP	32–48 (optional: 49–51)		

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Does Sen. Dianne Feinstein's age matter?



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Sen. Dianne Feinstein, if reelected, would be 85 at the conclusion of an additional term. (Tom Williams / Roll Call / Getty Images)



Endorsement: It's an easy call: Sen. Feinstein



Emken gives Feinstein the Forrest Gump treatment

By Michael McGough

October 30, 2012 11:25 a.m.

In her uphill campaign against Sen. Dianne Feinstein, Republican Elizabeth Emken, albeit obliquely, has made an issue of Feinstein's age. The senator turned 79 on June 22 and if reelected she would be 85 at the conclusion of one more term.

Would that be unusual? Yes, but not unprecedented. In the current Senate, Feinstein is the fifth oldest member. Three senators are 88: Frank Lautenberg of New Jersey and Daniel Inouye and Daniel Akaka of Hawaii. No. 4 is 80-year-old Richard Lugar of Indiana, who was defeated in his bid for renomination in this year's Republican primary.

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Your Host



Dan Turner has been an editorial editor or writer with the Times since 2004.



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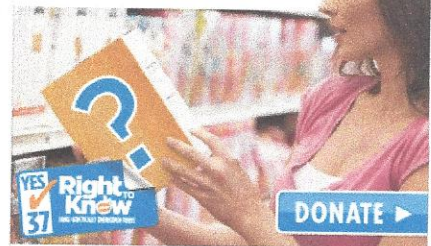
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In Case You Missed It...



Name:

Date:

Per:

Warm – up (5 minutes): After reading the article on Dianne Feinstein, consider that she is currently 79. Her first term as senator began in 1992 (many of you had not been born yet!). Do you feel that her age helps her as a senator (experience), or does it hurt her (is she out of touch with the people she represents)? Will you vote for her? Respond in a paragraph. Your paragraph must be (a minimum of) four sentences. The sentences should be complete, with correct spelling, grammar, punctuation, etc.

Directions: You will be given 6 minutes to work on a problem (or set of problems) at each station. Use this sheet to answer the questions in the given space according to the station at which you are seated. When the time signal is given, please move to the next station (in numerical order). Should you finish early at a given station, use the extra time to complete an unfinished problem from an earlier station. If you have any questions, please work with your station- mates, or raise your hand.

Station 1)

Station 2)

Station 3)

Station 4)

Station 5)

Station 6)

Station #1

Solve the following equations:

a) $20c + 5 = 5c + 65$

b) $3(a - 5) = -6$

c) $2(w - 3) + 5 = 3(w - 1)$

Station #2

On your paper, graph the following system of equations. State whether the following system has *no solution*, *infinitely many solutions*, or *one solution*. If it has *one solution*, name the point.

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

$$2x + y = 10$$

Station #3

Multiplication *M a N i A* (no phones or calculators – do these by hand!):

a) $15 \times 83 =$

b) $54 \times 43 =$

c) $91 \times 41 =$

d) $57 \times 56 =$

e) $22 \times 66 =$

Station #4

Find the slope that passes through the following pairs of points (Hint: $m = \frac{y_2 - y_1}{x_2 - x_1}$):

a) (2, 3) (9, 7)

b) (-3, 6) (2, 4)

c) (-4, -1) (-3, -3)

d) Make up your own set of coordinates, then solve for the slope

Station #5

Using the t- table, fill in the missing values for the following equation:

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

x	y
0	
4	

Station #6

Rearrange the following equations into $y = mx + b$ form:

a) $x = -y + 3$

b) $-8x + 4y = 8$

c) $3 - 5y = 2x$
