UNDERSTAND ▸

10. Use Structure When given a system of equations in slope-intercept form, which is the most efficient method to solve: graphing or substitution? Explain.

11. Look for Relationships After solving a system of equations using substitution, you end up with the equation $3 = 2$. What is true about the slope and y-intercepts of the lines in the system of equations?

12. Error Analysis Describe and correct the error a student made in finding the number of solutions of the system of equations.

$x - 2y = -4$
$5x - 3y = 1$

$x = 2y - 4$
$5x - 3y = 1$

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

Infinitely many solutions ✗

13. Use Structure When using substitution to solve systems of equations that have no solution or infinitely many solutions, the variables are the same on both sides. How is the solution determined by the constants in the equations?

14. Model With Mathematics The perimeter of a rectangle is 124 cm. The length is six more than three times the width. What are the dimensions of the rectangle?

15. Mathematical Connections Two angles are complementary. One angle is six more than twice the other. What is the measure of each angle?

16. Higher Order Thinking One equation in a system of equations is $5x - 2y = -4$.

  a. Write the second equation in the system of equations that would produce a graph with parallel lines.

  b. Write the second equation in the system of equations that would produce a graph with one line.

PRACTICE ▸

Use substitution to solve each system of equations.
SEE EXAMPLE 1

17. $y = 2x - 4$
$3x - 2y = 1$

18. $y = 3x - 8$
$y = 13 - 4x$

19. $y = 2x - 7$
$9x + y = 15$

20. $y = -\frac{1}{2}x$
$2x + 2y = 5$

21. $x = 3y - 4$
$2x - 3y = -2$

22. $x + 2y = -10$
$y = -\frac{1}{2}x + 2$

Consider the system of equations. SEE EXAMPLE 2
$x + y = 5$
$2x - y = -2$

23. Solve the system of equations by graphing.

24. Solve the system of equations using the substitution method.

25. Which method do you prefer in this instance? Explain.

Identify whether each system of equations has infinitely many solutions or no solution.
SEE EXAMPLE 3

26. $4x + 8y = -8$
$x = -2y + 1$

27. $2x - 3y = 6$
$y = \frac{2}{3}x - 2$

28. $2x + 2y = 6$
$4x + 4y = 4$

29. $2x + 5y = -5$
$y = -\frac{2}{5}x - 1$

Write and solve a system of equations for the situation. SEE EXAMPLE 4

30. At a hot air balloon festival, Mohamed's balloon is at an altitude of 40 m and rises 10 m/min. Dana's balloon is at an altitude of 165 m and descends 15 m/min.

  a. In how many minutes will both balloons be at the same altitude?

  b. What will be the altitude?

31. Richard and Teo have a combined age of 31. Richard is 4 years older than twice Teo's age. How old are Richard and Teo?
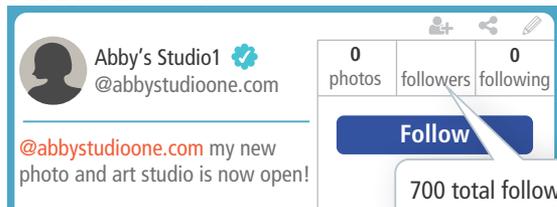
PRACTICE & PROBLEM SOLVING

Practice   Tutorial

Mixed Review Available Online

APPLY

32. Reason The sum of two numbers is 4. The larger number is 12 more than three times the smaller number. What are the numbers?

33. Use Structure In a basketball game, the Bulldogs make a total of 21 shots. Some of the shots are 2-point shots while others are 3-point shots. The Bulldogs score a total of 50 points. How many 2-point and 3-point shots did they make?

34. Make Sense and Persevere Stay Fit gym charges a membership fee of $75. They offer karate classes for an additional fee.
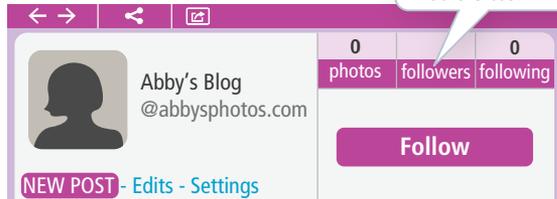
KARATE
Members: $3 per class
Non-members: $8 per class

a. How many classes could members and non-members take before they pay the same amount?

b. How much would they pay?

35. Model With Mathematics Abby uses two social media sites. She has 52 more followers on Site A than on Site B. How many followers does she have on each site?

Social Media Site A

Abby's Studio1 ✔
@abbystudioone.com

| 0 | 0 | 0 |
| photos | followers | following |

Follow

@abbystudioone.com my new photo and art studio is now open!

700 total followers for both social media sites.

Social Media Site B

Abby's Blog
@abbysphotos.com

| 0 | 0 | 0 |
| photos | followers | following |

Follow

NEW POST - Edits - Settings

ASSESSMENT PRACTICE

36. What are the x- and y-coordinates of the solution for the system of equations?

$$x = -y + 4$$
$$2x + 3y = 4$$

x-coordinate = _____

y-coordinate = _____

37. SAT/ACT Describe the solution of the system of equations.

$$2x - 5y = -5$$
$$y = \frac{2}{5}x - 2$$

Ⓐ No solution

Ⓑ Infinitely many solutions

Ⓒ (10, 5)

Ⓓ (5, 3)

38. Performance Task Each side of a triangle lies along a line in a coordinate plane. The three lines that contain these sides are represented by the given equations.

Equation 1: $x - 2y = -4$

Equation 2: $2x + y = -3$

Equation 3: $7x - 4y = 12$

Part A Write three systems of equations that can be used to determine the vertices of the triangle.

Part B What are the coordinates of the vertices?

Part C Is this a right triangle? Explain.

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