5.2 Practice with CalcChat® and CalcView®

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In Exercises 1–6, describe how you would obtain an equation in one variable to solve the system by substitution.

1. $x + 4y = 30$
   $x = 2y$

2. $y = -8x + 2$
   $2x + y = -10$

3. $12y = x - 15$
   $-3x + 12y = 3$

4. $5x + 3y = 11$
   $5x = y + 5$

5. $x - y = -3$
   $4x + 3y = -5$

6. $3x + 5y = 25$
   $x - 2y = -6$

In Exercises 7–16, solve the system by substitution. Check your solution. *Examples 1 and 2*

7. $x = 17 - 4y$
   $y = x - 2$

8. $6x - 9 = y$
   $y = -3x$

9. $x = 16 - 4y$
   $3x + 4y = 8$

10. $-5x + 3y = 51$
    $y = 10x - 8$

11. $-5x + 6y = -11$
    $6y = x + 5$

12. $8x = 5y + 24$
    $-9y = 40 - 8x$

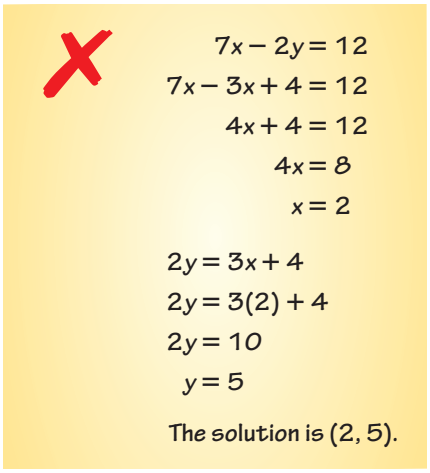
13. $2x - 3y = -9$
    $x - 5y = -29$

14. $2x - y = 23$
    $x + 4y = -20$

15. $\frac{1}{3}x + y = -1$
    $\frac{1}{3}x + 8y = 13$

16. $5x + 2y = 9$
    $-0.5x - y = 7.5$

17. **ERROR ANALYSIS** Describe and correct the error in solving the linear system $2y = 3x + 4$ and $7x - 2y = 12$.



$$7x - 2y = 12$$
$$7x - 3x + 4 = 12$$
$$4x + 4 = 12$$
$$4x = 8$$
$$x = 2$$

$$2y = 3x + 4$$
$$2y = 3(2) + 4$$
$$2y = 10$$
$$y = 5$$

The solution is (2, 5).

18. **ERROR ANALYSIS** Describe and correct the error in solving for one of the variables in the linear system $8x + 2y = -12$ and $5x - y = 4$.

$$5x - y = 4$$
$$-y = -5x + 4$$
$$y = 5x - 4$$

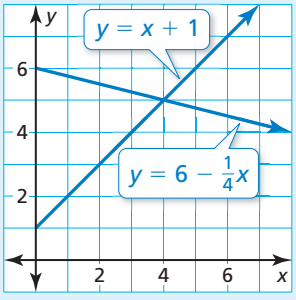
$$5x - (5x - 4) = 4$$
$$5x - 5x + 4 = 4$$
$$4 = 4$$

19. **MODELING REAL LIFE** A test is worth 100 points. Each problem is worth either 2 points or 5 points. The number of 5-point problems is 22 less than the number of 2-point problems. How many problems of each type are on the test? *Example 3*

20. **MODELING REAL LIFE** A group spends $277.50 to rent a total of 15 tubes. How many of each type of tube does the group rent?

21. **OPEN-ENDED** Write a linear system that has the ordered pair (15, −25) as its solution. Then solve the system by substitution to justify your answer.

22. **HOW DO YOU SEE IT?** The graphs of two linear equations are shown.



   a. At what point do the lines appear to intersect?

   b. Can you solve a system of linear equations by substitution to check your answer in part (a)? Explain.

23. **MAKING AN ARGUMENT** To solve the system $-7x - 2y = 21$ and $-7x = 42 - y$ by substitution, you begin by solving for y in the second equation. Your friend says that this step is not necessary. Is your friend correct? Explain.

24. **COLLEGE PREP** For the system shown, what is the value of $y - x$?

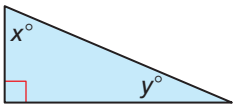
$$x + \frac{3}{4}y = -14$$
$$-4x + 3y = -16$$

Ⓐ -17 Ⓑ -7

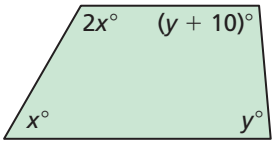
Ⓒ 7 Ⓓ 17

CONNECTING CONCEPTS **In Exercises 25 and 26, find the values of x and y.**

25. $x + 2 = 3y$



26. $-2x + y = -35$



27. MP **REASONING** Find the values of a and b so that the solution of the linear system is $(-9, 1)$.

$$ax + by = -31 \quad \text{Equation 1}$$
$$ax - by = -41 \quad \text{Equation 2}$$

28. **THOUGHT PROVOKING**
Write a system of linear equations in which $(3, -5)$ is a solution of Equation 1 but not a solution of Equation 2, and $(-1, 7)$ is the solution of the system. Then solve the system by substitution to verify that $(-1, 7)$ is the solution.

29. MP **NUMBER SENSE** The sum of the digits of a two-digit number is 11. When the digits are reversed, the number increases by 27. Find the original number.

30. DIG DEEPER You withdraw $375 from your bank account. You receive a stack of 24 bills consisting of $5, $10, and $20 bills. The number of $5 bills is one-half the number of $10 bills. How many of each type of bill do you receive?

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In Exercises 31–33, find the sum or difference.

31. $(x - 4) + (2x - 7)$

32. $(6d + 2) - (3d - 3)$

33. $2(5v + 6) - 6(-9v + 2)$

34. Solve the system by substitution.

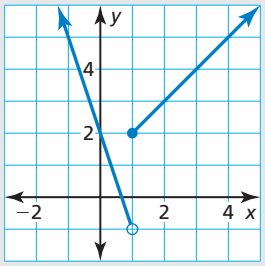
$$x - 8y = 7$$
$$5x + 6y = 12$$

35. The theoretical probability of drawing a red marble from a bag is $\frac{2}{5}$. The bag contains 60 marbles.

a. How many red marbles are in the bag?

b. A marble is drawn from the bag and replaced 80 times. How many times do you expect a red marble to be drawn?

36. Write a piecewise function represented by the graph.



37. MP **REASONING** Find the value of a so that the line that passes through $(-5, a)$ and $(1, -10)$ has a slope of $-\frac{4}{3}$.

38. Write an equation for the nth term of the arithmetic sequence shown. Then find a_{15}.

$$-14, -5, 4, 13, \ldots$$

In Exercises 39 and 40, graph the function. Compare the graph to the graph of $f(x) = |x|$. Find the domain and range.

39. $g(x) = |x + 5|$

40. $p(x) = |x| - 8$

41. Solve the system by graphing.

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

42. Solve $3|2x - 7| > 18$. Graph the solution.

43. **MODELING REAL LIFE**
An investor owns shares of Stock A and Stock B. The investor owns a total of 200 shares with a total value of $4000. How many shares of each stock does the investor own?

Stock	Price
A	$9.50
B	$27.00