

Practice 2-2

Solving Equations with Variables on Both Sides

1. Use the algebra tiles to find the value of x when the expression $6x + 2$ equals $4x + 10$. Simplify your answer.

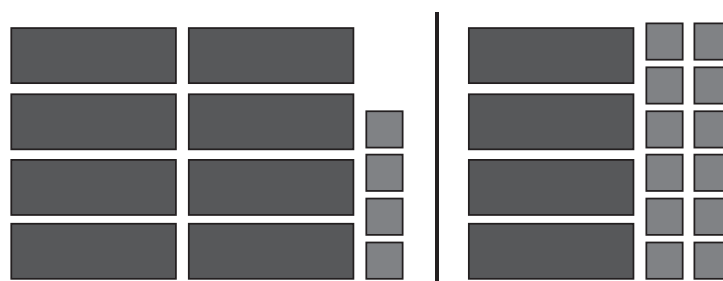


2. Use the algebra tiles to find the value of x when the expression $4x + 6$ equals $2x + 4$.



3. Which is the value of n when $6n - 10 = 4n + 6$?
4. A town has accumulated 5 inches of snow, and the snow depth is increasing by 6 inches every hour. A nearby town has accumulated 6 inches, and the depth is increasing by 2 inches every hour. In about how many hours will the snowfall of the towns be equal? Round your answer to the nearest tenth.
5. Find the value of x when $6 - 4x = 6x - 8x + 2$.
6. A town's population is 43,425. About 125 people move out of the town each month. Each month, 200 people on average move into town. A nearby town has a population of 45,000. It has no one moving in and an average of 150 people moving away every month.
 - a) Which equation models the situation?
 - ☐ A. $200m + 125m + 45,000 = 43,425 + 150m$
 - ☐ B. $200m - 125m + 43,425 = 45,000 - 150m$
 - ☐ C. $200m + 125m + 43,425 = 45,000 + 150m$
 - ☐ D. $200m - 125m + 45,000 = 43,425 - 150m$
 - b) In about how many months will the population of the towns be equal?

7. a) **Writing** Find the value of g when $5g + 9$ equals $2g + 15$.
- b) Explain how you can check that the value you found for g is correct. If your check does not work, does that mean that your result is incorrect? Explain.
8. **Mental Math** What is the value of k when $30k + 80 = 20k + 120$?
9. **Health Club Fees** You are choosing between two health clubs. Club A offers membership for a fee of \$28 plus a monthly fee of \$24. Club B offers membership for a fee of \$35 plus a monthly fee of \$17. After how many months will the total cost of each health club be the same?
10. **Reasoning** To solve an equation in x , you simplify the equation so that it becomes easy to tell which value(s) of x make the equation true.
- a) Simplify $-6x + 13 + 7x = 6 + x + 7$ until you have the equation in the form $x = \underline{\hspace{2cm}}$. Tell what value(s) of x make the equation true.
- b) What can you conclude about the original equation?
11. **Error Analysis** You and a friend are doing math homework together. You have to solve the equation $5x + 4x - 68 = 34 - 8x$. Your friend arrives at the incorrect answer $x = -2$.
- a) Find the correct value of x .
- b) What possible error could your friend have made to get $x = -2$?
- ☐ A. Your friend should have added $8x$ to each side of the equation, but instead subtracted $8x$ from the left side.
 - ☐ B. Your friend should have added $5x$ and $4x$ to get a sum of $9x$, but instead got a sum of $10x$.
 - ☐ C. Your friend should have added 68 to each side of the equation, but instead subtracted 68 from the right side.
12. **Multiple Representations** You can use algebra tiles to model and solve the equation $8x + 4 = 4x + 12$.



- a) What are two other ways to write the equation?
- ☐ A. $8x + 8 = -4x$ and $4x - 4 = 12$
 - ☐ B. $-8x = 8 - 4x$ and $8x + 8 = -4x$
 - ☐ C. $8x + 8 = 4x$ and $4x + 12 = 4$
 - ☐ D. $8x - 8 = 4x$ and $4x + 4 = 12$
- b) Solve the equation to find the value of x .

13. Solve the equation to find the value of x .

$$6 - 6x = 5x - 9x - 2$$

14. **Think About the Process**

a) How would you set up a model for the equation $7x + 4 = 3x + 8$ using algebra tiles?

- ☐ A. Place 4 x -tiles and 7 ones-tiles for the left side of the equation.
Place 8 x -tiles and 3 ones-tiles for the right side of the equation.
- ☐ B. Place 7 x -tiles and 4 ones-tiles for the left side of the equation.
Place 3 x -tiles and 8 ones-tiles for the right side of the equation.
- ☐ C. Place 7 x -tiles and 8 ones-tiles for the left side of the equation.
Place 3 x -tiles and 4 ones-tiles for the right side of the equation.
- ☐ D. None of these models the equation.

b) Draw your model.

c) Find the value of x that makes the equation true.

15. **Think About the Process** You are given the equation, $34 - 7x = 15 + 12x$.

a) What would you do first to find x ?

- ☐ A. Subtract $7x$ from each side of the equation.
- ☐ B. Divide each side of the equation by -7 .
- ☐ C. Multiply each side of the equation by -7 .
- ☐ D. Add $7x$ to each side of the equation.

b) What value of x makes the equation true?

1. 4
2. -1
3. $n = 8$
4. 0.3 hr
5. $x = 2$
6. a) B
b) 7 months
7. a) $g = 2$
b) Answers will vary
8. 4
9. 1 month
10. a) $x = x$
b) Answers will vary
11. a) 6
b) C
12. a) D
b) $x = 2$
13. $x = 4$
14. a) B
b) Answers will vary
c) Answers will vary
15. a) D
b) $x = 1$