An algebraic expression in simplest form has no like terms or parentheses.

| Not Simplified | Simplified |
|---|---|
| $2(3x - 5 + 4x)$ | $14x - 10$ |

You can use the Distributive Property to help combine like terms. Think of the Distributive Property as $ba + ca = (b + c)a$.

**Problem 5** Combining Like Terms

What is the simplified form of each expression?

**A** $8x^2 + 2x^2$

$8x^2 + 2x^2 = (8 + 2)x^2$    Distributive Property

$= 10x^2$    Simplify.

**B** $5x - 3 - 3x + 6y + 4$

$5x - 3 - 3x + 6y + 4 = 5x + (-3) + (-3x) + 6y + 4$    Rewrite as a sum.

$= 5x + (-3x) + 6y + (-3) + 4$    Commutative Property

$= (5 - 3)x + 6y + (-3) + 4$    Distributive Property

$= 2x + 6y + 1$    Simplify.

**Got It?** **5.** What is the simplified form of each expression in parts (a)–(c)?

   **a.** $3y - y$      **b.** $-7mn^4 - 5mn^4$      **c.** $7y^3z - 6yz^3 + y^3z$

   **d. Reasoning** Can you simplify $8x^2 - 2x^4 - 2x + 2 + xy$ further? Explain.

## Lesson Check

### Do you know HOW?

**1.** What is the simplified form of each expression? Use the Distributive Property.

   **a.** $(j + 2)7$

   **b.** $-8(x - 3)$

   **c.** $-(4 - c)$

   **d.** $-(11 + 2b)$

Rewrite each expression as a sum.

**2.** $-8x^2 + 3xy - 9x - 3$

**3.** $2ab - 5ab^2 - 9a^2b$

Tell whether the terms are like terms.

**4.** $3a$ and $-5a$      **5.** $2xy^2$ and $-x^2y$

### Do you UNDERSTAND?

MATHEMATICAL PRACTICES

**6. Vocabulary** Does each equation demonstrate the Distributive Property? Explain.

   **a.** $-2(x + 1) = -2x - 2$

   **b.** $(s - 4)8 = 8(s - 4)$

   **c.** $5n - 45 = 5(n - 9)$

   **d.** $8 + (t + 6) = (8 + t) + 6$

**7. Mental Math** How can you express 499 to find the product $499 \times 5$ using mental math? Explain.

**8. Reasoning** Is each expression in simplified form? Justify your answer.

   **a.** $4xy^3 + 5x^3y$

   **b.** $-(y - 1)$

   **c.** $5x^2 + 12xy - 3yx$

## Practice and Problem-Solving Exercises

**MATHEMATICAL PRACTICES**

**A Practice** Use the Distributive Property to simplify each expression.

See Problem 1.

**9.** $6(a + 10)$     **10.** $8(4 + x)$     **11.** $(5 + w)5$     **12.** $(2t + 3)11$

**13.** $10(9 - t)$     **14.** $12(2j - 6)$     **15.** $16(7b + 6)$     **16.** $(1 + 3d)9$

**17.** $(3 - 8c)1.5$     **18.** $(5w - 15)2.1$     **19.** $\frac{1}{4}(4f - 8)$     **20.** $6\left(\frac{1}{3}h + 1\right)$

**21.** $(-8z - 10)(-1.5)$     **22.** $0(3.7x - 4.21)$     **23.** $1\left(\frac{3}{11} - \frac{7d}{17}\right)$     **24.** $\frac{1}{2}\left(\frac{1}{2}y - \frac{1}{2}\right)$

Write each fraction as a sum or difference.

See Problem 2.

**25.** $\frac{2x + 7}{5}$     **26.** $\frac{17 + 5n}{4}$     **27.** $\frac{8 - 9x}{3}$     **28.** $\frac{4y - 12}{2}$

**29.** $\frac{25 - 8t}{5}$     **30.** $\frac{18x + 51}{17}$     **31.** $\frac{22 - 2n}{2}$     **32.** $\frac{42w + 14}{7}$

Simplify each expression.

See Problem 3.

**33.** $-(20 + d)$     **34.** $-(-5 - 4y)$     **35.** $-(9 - 7c)$     **36.** $-(-x + 15)$

**37.** $-(18a - 17b)$     **38.** $-(2.1c - 4d)$     **39.** $-(-m + n + 1)$     **40.** $-(x + 3y - 3)$

Use mental math to find each product.

See Problem 4.

**41.** $5.1 \times 8$     **42.** $3 \times 7.25$     **43.** $299 \times 3$     **44.** $4 \times 197$

**45.** $3.9 \times 6$     **46.** $5 \times 2.7$     **47.** $6.15 \times 4$     **48.** $6 \times 9.1$

**49.** You buy 50 of your favorite songs from a Web site that charges $.99 for each song. What is the cost of 50 songs? Use mental math.

**50.** The perimeter of a baseball diamond is about 360 ft. If you take 12 laps around the diamond, what is the total distance you run? Use mental math.

**51.** One hundred and five students see a play. Each ticket costs $45. What is the total amount the students spend for tickets? Use mental math.

**52.** Suppose the distance you travel to school is 5 mi. What is the total distance for 197 trips from home to school? Use mental math.

Simplify each expression by combining like terms.

See Problem 5.

**53.** $11x + 9x$     **54.** $8y - 7y$     **55.** $5t - 7t$

**56.** $-n + 4n$     **57.** $5w^2 + 12w^2$     **58.** $2x^2 - 9x^2$

**59.** $-4y^2 + 9y^2$     **60.** $6c - 4 + 2c - 7$     **61.** $5 - 3x + y + 6$

**62.** $2n + 1 - 4m - n$     **63.** $-7h + 3h^2 - 4h - 3$     **64.** $10ab + 2ab^2 - 9ab$

**B Apply** Write a word phrase for each expression. Then simplify each expression.

**65.** $3(t - 1)$     **66.** $4(d + 7)$     **67.** $\frac{1}{3}(6x - 1)$