

Alg 1 1.4

$$6(197)$$
$$6(200-3)$$
$$1200-18 = 1182$$

Use the distributive property to evaluate expressions

Use the distributive property to simplify expressions

term

like terms

coefficient

$$25(102)$$
$$25(100+2)$$
$$2500+50$$
$$2550$$

**Example 3** Algebraic Expressions

Rewrite each expression using the Distributive Property. Then simplify.

a.  $7(3w - 5)$

$$7(3w - 5)$$

$$7 \cdot 3w + 7 \cdot -5$$

$$21w + -35$$

3A.  $(8 + 4n)^2$

3B.  $-6(r + 3g - f)$

3C.  $(2 - 5q)(-3)$

3D.  $-4(-8 - 3m)$

$$(3x^2 + 5x + 13x + 9x) + 3 + 11 - 6$$
$$-11x^2 + 14x + 8$$

ICE WS

**Like terms** are terms that contain the same variables, with corresponding variables having the same power.

$$5x^2 + 2x - 4$$

three terms

$$6a^2 + a^2 + 2a$$

like terms

unlike terms

Simplify each expression. If not possible, write *simplified*.

**4A.**  $6n - 4n$

**4B.**  $b^2 + 13b + 13$

**4C.**  $4y^3 + 2y - 8y + 5$

**4D.**  $7a + 4 - 6a^2 - 2a$

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### Example 5 Write and Simplify Expressions

Use the expression *twice the difference of  $3x$  and  $y$  increased by five times the sum of  $x$  and  $2y$ .*

- a. Write an algebraic expression for the verbal expression.

Words

twice the difference  
of  $3x$  and  $y$

increased by

five times the sum  
of  $x$  and  $2y$

### Guided Practice

- i. Use the expression *5 times the difference of  $q$  squared and  $r$  plus 8 times the sum of  $3q$  and  $2r$ .*
- A. Write an algebraic expression for the verbal expression.
- B. Simplify the expression, and indicate the properties used.

**ConceptSummary** Properties of Numbers

The following properties are true for any numbers  $a$ ,  $b$ , and  $c$ .

| Properties   | Addition                                           | Multiplication                                    |
|--------------|----------------------------------------------------|---------------------------------------------------|
| Commutative  | $a + b = b + a$                                    | $ab = ba$                                         |
| Associative  | $(a + b) + c = a + (b + c)$                        | $(ab)c = a(bc)$                                   |
| Identity     | 0 is the identity.<br>$a + 0 = 0 + a = a$          | 1 is the identity.<br>$a \cdot 1 = 1 \cdot a = a$ |
| Zero         | —                                                  | $a \cdot 0 = 0 \cdot a = 0$                       |
| Distributive | $a(b + c) = ab + ac$ and $(b + c)a = ba + ca$      |                                                   |
| Substitution | If $a = b$ , then $a$ may be substituted for $b$ . |                                                   |

**Simplify each expression.**

**42.**  $6x + 4y + 5x$

**43.**  $3m + 5g + 6g + 11m$

**44.**  $4a + 5a^2 + 2a^2 + a^2$

**45.**  $5k + 3k^3 + 7k + 9k^3$

**46.**  $6d + 4(3d + 5)$

**47.**  $2(6x + 4) + 7x$



