

**7-8** Multiplying PolynomialsWarm UpLesson PresentationLesson Quiz

Holt McDougal Algebra 1

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**7-8** Multiplying Polynomials**Warm Up**  
**Evaluate.**

1.  $3^2$

2.  $2^4$

3.  $10^2$

**Simplify.**

4.  $2^3 \cdot 2^4$

5.  $y^5 \cdot y^4$

6.  $(5^3)^2$

7.  $(x^2)^4$

8.  $-4(x - 7)$

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### Answers to Adding and Subtracting Polynomials

- |  |                                  |                                |                  |
|--|----------------------------------|--------------------------------|------------------|
| 1) $-3x^4 + 2x$                          | 2) $a^3 + 5$                     | 3) $10n^4 - 5n^3 - n$          | 4) $-6x^4 + 3x$  |
| 5) $5m^3 + 2m^2 + 7m$                    | 6) $6k$                          | 7) $v^3 + 7v$                  | 8) $2x^4 + 7x^2$ |
| 9) $-21n^4 + 14n + 4$                    | 10) $3x^5 + 6x^3 + 24x^2 - 6$    | 11) $-k^4 - 3k^3 - 3k - 13$    |                  |
| 12) $-25v^5 + 3v^3 + 1$                  | 13) $3m^4 + 14m^2 - 3$           | 14) $-8p^5 + 24p^4 - 14p^3$    |                  |
| 15) $19n^5 + 14n - 5$                    | 16) $-6n^2 + 16n - 7$            | 17) $-9n^3 - 12m^3 + 4m$       |                  |
| 18) $-9x^3y^4 + 17x^4y - 12xy^2$         | 19) $-4x^4y^3 + 11x^2y^4 + 6y^2$ | 20) $-8x^4y^3 + 32y^4 + 26x^3$ |                  |
| 21) $11a^3b^3 + 10a^3b^2 + 3b^2 + 25a^2$ | 22) $20x^4y - xy^4 - 14x^2y^2$   |                                |                  |
| 23) $9x^4y^4 + 5x^3y^3 - 13y^3 - 4$      | 24) $-11u^4v^2 + 13uv^2 - 26u$   |                                |                  |

Feb 6-7:11 AM

## 7-8 Multiplying Polynomials

### *Objective*

Multiply polynomials.

## 7-8 Multiplying Polynomials

### Example 1: Multiplying Monomials

Multiply.

A.  $(6y^3)(3y^5)$

Handwritten work for problem A:  $6 \times 3 = 18$  and  $3 + 5 = 8$ , resulting in  $18y^8$ .

B.  $(3mn^2)(9m^2n)$

$(3mn^2)(9m^2n)$

$(3 \cdot 9)(m \cdot m^2)(n^2 \cdot n)$

$27m^3n^3$

*Group factors with like bases together.*

## 7-8 Multiplying Polynomials

To multiply a polynomial by a monomial, use the Distributive Property.

## 7-8 Multiplying Polynomials

### Example 2A: Multiplying a Polynomial by a Monomial

**Multiply.**

$$4(3x^2 + 4x - 8)$$

$$4(3x^2 + 4x - 8)$$

*Distribute 4.*

$$(4)3x^2 + (4)4x - (4)8$$

*Multiply.*

$$12x^2 + 16x - 32$$

## 7-8 Multiplying Polynomials

### Example 2B: Multiplying a Polynomial by a Monomial

**Multiply.**

$$6pq(2p - q)$$

$$(6pq)(2p - q)$$

*Distribute 6pq.*

$$(6pq)2p + (6pq)(-q)$$

$$12p^2q - 6pq^2$$

*Multiply.*

## 7-8 Multiplying Polynomials

### Example 2C: Multiplying a Polynomial by a Monomial

Multiply.

$$\frac{1}{2}x^2y(6xy + 8x^2y^2)$$

$$3x^3y^2 + 4x^4y^3$$

## 7-8 Multiplying Polynomials

### Check It Out! Example 2

Multiply.

$$\text{a. } 2(4x^2 + x + 3)$$

$$8x^2 + 2x + 6$$

**7-8** Multiplying Polynomials**Check It Out! Example 2**

Multiply.

b.  $3ab(5a^2 + b)$

$$15a^3b + 3ab^2$$

**7-8** Multiplying Polynomials**Check It Out! Example 2**

Multiply.

c.  $5r^2s^2(r - 3s)$

$$-5r^3s^2 + 15r^2s^3$$

$$-\frac{1}{2}x^2yz^{-2}(4x^2yz^{-1} + 2xyz^{-2} + 4xy^3z^{-1})$$

$$-2x^4y^2z^{-3} - x^3y^2z^{-4} - 2x^3y^4z^{-3}$$

Feb 6-6:40 AM

$$\frac{7}{4z} \left( \frac{4}{5}x + \frac{3}{7}z \right)$$

$$\frac{28}{20}xz + \frac{21}{28}z^2$$

$$\frac{7}{5}xz + \frac{3}{4}z^2$$

Feb 6-8:12 AM