

**8-7 Study Guide and Intervention** (continued)**Multiplying Polynomials**

**Multiply Polynomials** The Distributive Property can be used to multiply any two polynomials.

**Example** Find  $(3x + 2)(2x^2 - 4x + 5)$ .

$$\begin{aligned} & (3x + 2)(2x^2 - 4x + 5) \\ &= 3x(2x^2 - 4x + 5) + 2(2x^2 - 4x + 5) && \text{Distributive Property} \\ &= 6x^3 - 12x^2 + 15x + 4x^2 - 8x + 10 && \text{Distributive Property} \\ &= 6x^3 - 8x^2 + 7x + 10 && \text{Combine like terms.} \end{aligned}$$

The product is  $6x^3 - 8x^2 + 7x + 10$ .

**Exercises**

Find each product.

1.  $(x + 2)(x^2 - 2x + 1)$

2.  $(x + 3)(2x^2 + x - 3)$

3.  $(2x - 1)(x^2 - x + 2)$

4.  $(p - 3)(p^2 - 4p + 2)$

5.  $(3k + 2)(k^2 + k - 4)$

6.  $(2t + 1)(10t^2 - 2t - 4)$

7.  $(3n - 4)(n^2 + 5n - 4)$

8.  $(8x - 2)(3x^2 + 2x - 1)$

9.  $(2a + 4)(2a^2 - 8a + 3)$

10.  $(3x - 4)(2x^2 + 3x + 3)$

11.  $(n^2 + 2n - 1)(n^2 + n + 2)$

12.  $(t^2 + 4t - 1)(2t^2 - t - 3)$

13.  $(y^2 - 5y + 3)(2y^2 + 7y - 4)$

14.  $(3b^2 - 2b + 1)(2b^2 - 3b - 4)$

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**Example** Find  $(3x + 2)(2x^2 - 4x + 5)$ .

$$\begin{aligned} & (3x + 2)(2x^2 - 4x + 5) \\ &= 3x(2x^2 - 4x + 5) + 2(2x^2 - 4x + 5) && \text{Distributive Property} \\ &= 6x^3 - 12x^2 + 15x + 4x^2 - 8x + 10 && \text{Distributive Property} \\ &= 6x^3 - 8x^2 + 7x + 10 && \text{Combine like terms.} \end{aligned}$$

The product is  $6x^3 - 8x^2 + 7x + 10$ .

**Exercises**

Find each product.

1.  $(x + 2)(x^2 - 2x + 1)$

$$x^3 - 3x + 2$$

2.  $(x + 3)(2x^2 + x - 3)$

$$2x^3 + 7x^2 - 9$$

3.  $(2x - 1)(x^2 - x + 2)$

$$2x^3 - 3x^2 + 5x - 2$$

4.  $(p - 3)(p^2 - 4p + 2)$

$$p^3 - 7p^2 + 14p - 6$$

5.  $(3k + 2)(k^2 + k - 4)$

$$3k^3 + 5k^2 - 10k - 8$$

6.  $(2t + 1)(10t^2 - 2t - 4)$

$$20t^3 + 6t^2 - 10t - 4$$

7.  $(3n - 4)(n^2 + 5n - 4)$

$$3n^3 + 11n^2 - 32n + 16$$

8.  $(8x - 2)(3x^2 + 2x - 1)$

$$24x^3 + 10x^2 - 12x + 2$$

9.  $(2a + 4)(2a^2 - 8a + 3)$

$$4a^3 - 8a^2 - 26a + 12$$

10.  $(3x - 4)(2x^2 + 3x + 3)$

$$6x^3 + x^2 - 3x - 12$$

11.  $(n^2 + 2n - 1)(n^2 + n + 2)$

$$n^4 + 3n^3 + 3n^2 + 3n - 2$$

12.  $(t^2 + 4t - 1)(2t^2 - t - 3)$

$$2t^4 + 7t^3 - 9t^2 - 11t + 3$$

13.  $(y^2 - 5y + 3)(2y^2 + 7y - 4)$

$$2y^4 - 3y^3 - 33y^2 + 41y - 12$$

14.  $(3b^2 - 2b + 1)(2b^2 - 3b - 4)$

$$6b^4 - 13b^3 - 4b^2 + 5b - 4$$