

## 8-1

## Reteaching

## Adding and Subtracting Polynomials

You can add and subtract polynomials by lining up like terms and then adding or subtracting each part separately.

**Problem**

What is the simplified form of  $(3x^2 - 4x + 5) + (5x^2 + 2x - 8)$ ?

Write the problem vertically, lining up the like terms.

Then add each pair of like terms.

$$\begin{array}{r} 3x^2 - 4x + 5 \\ + 5x^2 + 2x - 8 \\ \hline \end{array}$$

**Solve** Add the  $x^2$  terms.

$$3x^2 + 5x^2 = 8x^2$$

Add the  $x$  terms.

$$-4x + 2x = -2x$$

Add the constant terms.

$$5 + (-8) = -3$$

$$\begin{array}{r} 3x^2 - 4x + 5 \\ + 5x^2 + 2x - 8 \\ \hline 8x^2 - 2x - 3 \end{array} \quad \text{Add the sums.}$$

**Check** Check your solution using subtraction.

$$8x^2 - 5x^2 = 3x^2$$

$$-2x - 2x = -4x$$

$$-3 - (-8) = 5$$

Solution:  $(3x^2 - 4x + 5) + (5x^2 + 2x - 8) = 8x^2 - 2x - 3$

**Exercises**

Simplify.

$$1. \quad \begin{array}{r} 5b^2 + 3b \\ + 2b^2 - 5b \\ \hline 7b^2 - 2b \end{array}$$

$$2. \quad \begin{array}{r} 3c^2 + 3c \\ + 4c^2 + 2c \\ \hline 7c^2 + 5c \end{array}$$

$$3. \quad \begin{array}{r} 4d^2 - 3d + 6 \\ + 2d^2 + 5d - 3 \\ \hline 6d^2 + 2d + 3 \end{array}$$

$$4. \quad \begin{array}{r} -3e^2 - 5e + 2 \\ + e^2 + 2e - 7 \\ \hline -2e^2 - 3e - 5 \end{array}$$

$$5. \quad \begin{array}{r} 4f^3 + 2f^2 + 5f \\ + 2f^3 - 4f^2 - 3f \\ \hline 6f^3 - 2f^2 + 2f \end{array}$$

$$6. \quad \begin{array}{r} 5g^3 - 2g^2 + 3g \\ + 2g^3 + 5g^2 - 2g \\ \hline 7g^3 + 3g^2 + g \end{array}$$

$$7. \quad \begin{array}{r} (3h^2 + 5) + (-5h^2 - 3) \\ \hline -2h^2 + 2 \end{array}$$

$$8. \quad \begin{array}{r} (2j^2 + 4j - 6) + (4j^2 - 3j - 3) \\ \hline 6j^2 + j - 9 \end{array}$$

# 8-1 **Reteaching** (continued)

## Adding and Subtracting Polynomials

To subtract polynomials, follow the same steps as in addition.

### Problem

What is the simplified form of  $(6x^3 + 4x^2 - 3x) - (2x^3 + 3x^2 - 5x)$ ?

Write the problem vertically, lining up the like terms.

Then subtract each pair of like terms.

$$\begin{array}{r} 6x^3 + 4x^2 - 3x \\ - (2x^3 + 3x^2 - 5x) \\ \hline \end{array}$$

### Solve

Subtract the  $x^3$  terms.

$$6x^3 - 2x^3 = 4x^3$$

Subtract the  $x^2$  terms.

$$4x^2 - 3x^2 = x^2$$

Subtract the  $x$  terms.

$$-3x - (-5x) = 2x$$

$$\begin{array}{r} 6x^3 + 4x^2 - 3x \\ - (2x^3 + 3x^2 - 5x) \\ \hline 4x^3 + x^2 + 2x \end{array} \quad \text{Add the differences.}$$

**Check** Check your solution using subtraction.

$$4x^3 + 2x^3 = 6x^3 \quad x^2 + 3x^2 = 4x^2 \quad 2x + (-5x) = -3x$$

$$\text{Solution: } (6x^3 + 4x^2 - 3x) - (2x^3 + 3x^2 - 5x) = 4x^3 + x^2 + 2x$$

### Exercises

Simplify.

$$9. \begin{array}{r} 4k^2 + 5k \\ - (3k^2 + 2k) \\ \hline k^2 + 3k \end{array}$$

$$10. \begin{array}{r} 5m^2 - 4m \\ - (2m^2 + 3m) \\ \hline 3m^2 - 7m \end{array}$$

$$11. \begin{array}{r} 7n^2 + 4n + 9 \\ - (4n^2 + 3n + 5) \\ \hline 3n^2 + n + 4 \end{array}$$

$$12. \begin{array}{r} 5p^2 + 6p + 4 \\ - (7p^2 + 4p + 8) \\ \hline -2p^2 + 2p - 4 \end{array}$$

$$13. \begin{array}{r} 3q^3 + 2q^2 + 7q \\ - (6q^3 - 4q^2 - 5q) \\ \hline -3q^3 + 6q^2 + 12q \end{array}$$

$$14. \begin{array}{r} 2r^3 - 2r^2 + 5r \\ - (4r^3 + 5r^2 + 3r) \\ \hline -2r^3 - 7r^2 + 2r \end{array}$$

$$15. (6s^2 - 5s) - (-2s^2 + 3s) \\ 8s^2 - 8s$$

$$16. (3w^2 + 6w - 5) - (5w^2 - 4w + 2) \\ -2w^2 + 10w - 7$$