

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.

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

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

$$8x^2 - 2x - 3 \quad \text{Add the sums.}$$

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.

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

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

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

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

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

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

$$7. (3h^2 + 5) + (-5h^2 - 3)$$

$$8. (2j^2 + 4j - 6) + (4j^2 - 3j - 3)$$

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.

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

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

Add the differences.

Check Check your solution using subtraction.

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

$$x^2 + 3x^2 = 4x^2$$

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

Solution: $(6x^3 + 4x^2 - 3x) - (2x^3 + 3x^2 - 5x) = 4x^3 + x^2 + 2x$

Exercises

Simplify.

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

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

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

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

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

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

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

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