

8-5 Study Guide and Intervention**Adding and Subtracting Polynomials**

Add Polynomials To add polynomials, you can group like terms horizontally or write them in column form, aligning like terms vertically. **Like terms** are monomial terms that are either identical or differ only in their coefficients, such as $3p$ and $-5p$ or $2x^2y$ and $8x^2y$.

Example 1 Find $(2x^2 + x - 8) + (3x - 4x^2 + 2)$.

Horizontal Method

Group like terms.

$$\begin{aligned} (2x^2 + x - 8) + (3x - 4x^2 + 2) \\ = [(2x^2 + (-4x^2)) + (x + 3x) + [(-8) + 2]] \\ = -2x^2 + 4x - 6. \end{aligned}$$

The sum is $-2x^2 + 4x - 6$.

Example 2 Find $(3x^2 + 5xy) + (xy + 2x^2)$.

Vertical Method

Align like terms in columns and add.

$$\begin{array}{r} 3x^2 + 5xy \\ (+) 2x^2 + xy \\ \hline 5x^2 + 6xy \end{array} \quad \text{Put the terms in descending order.}$$

The sum is $5x^2 + 6xy$.**Exercises****Find each sum.**

1. $(4a - 5) + (3a + 6)$

2. $(6x + 9) + (4x^2 - 7)$

3. $(6xy + 2y + 6x) + (4xy - x)$

4. $(x^2 + y^2) + (-x^2 + y^2)$

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

6. $(2x^2 + 5xy + 4y^2) + (-xy - 6x^2 + 2y^2)$

7. $(5p + 2q) + (2p^2 - 8q + 1)$

8. $(4x^2 - x + 4) + (5x + 2x^2 + 2)$

9. $(6x^2 + 3x) + (x^2 - 4x - 3)$

10. $(x^2 + 2xy + y^2) + (x^2 - xy - 2y^2)$

11. $(2a - 4b - c) + (-2a - b - 4c)$

12. $(6xy^2 + 4xy) + (2xy - 10xy^2 + y^2)$

13. $(2p - 5q) + (3p + 6q) + (p - q)$

14. $(2x^2 - 6) + (5x^2 + 2) + (-x^2 - 7)$

15. $(3z^2 + 5z) + (z^2 + 2z) + (z - 4)$

16. $(8x^2 + 4x + 3y^2 + y) + (6x^2 - x + 4y)$

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The sum is $-2x^2 + 4x - 6$.

Example 2 Find $(3x^2 + 5xy) + (xy + 2x^2)$.

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Align like terms in columns and add.

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

Put the terms in descending order.

The sum is $5x^2 + 6xy$.

Exercises

Find each sum.

1. $(4a - 5) + (3a + 6)$

$7a + 1$

2. $(6x + 9) + (4x^2 - 7)$

$4x^2 + 6x + 2$

3. $(6xy + 2y + 6x) + (4xy - x)$

$10xy + 5x + 2y$

4. $(x^2 + y^2) + (-x^2 + y^2)$

$2y^2$

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

$4p^2 - 9p + 10$

6. $(2x^2 + 5xy + 4y^2) + (-xy - 6x^2 + 2y^2)$

$-4x^2 + 4xy + 6y^2$

7. $(5p + 2q) + (2p^2 - 8q + 1)$

$2p^2 + 5p - 6q + 1$

8. $(4x^2 - x + 4) + (5x + 2x^2 + 2)$

$6x^2 + 4x + 6$

9. $(6x^2 + 3x) + (x^2 - 4x - 3)$

$7x^2 - x - 3$

10. $(x^2 + 2xy + y^2) + (x^2 - xy - 2y^2)$

$2x^2 + xy - y^2$

11. $(2a - 4b - c) + (-2a - b - 4c)$

$-5b - 5c$

12. $(6xy^2 + 4xy) + (2xy - 10xy^2 + y^2)$

$-4xy^2 + 6xy + y^2$

13. $(2p - 5q) + (3p + 6q) + (p - q)$

$6p$

14. $(2x^2 - 6) + (5x^2 + 2) + (-x^2 - 7)$

$6x^2 - 11$

15. $(3z^2 + 5z) + (z^2 + 2z) + (z - 4)$

$4z^2 + 8z - 4$

16. $(8x^2 + 4x + 3y^2 + y) + (6x^2 - x + 4y)$

$14x^2 + 3x + 3y^2 + 5y$