NAME _____ DATE _____

9-5 Adding and Subtracting Polynomials (Pages 522–527)

To add polynomials, you can group like terms and then find their sum, or you can write them in column form and then add. To subtract a polynomial, add its additive inverse, which is the opposite of each term in the polynomial.

EXAMPLES

Find each sum or difference.

A $(a^2 + 4a + 3) + (5a^2 - 2a - 7)$

Arrange like terms in column form and add. Follow the rules for adding signed numbers.

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

B $(12x + 7y) - (-x + 2y)$

Find the additive inverse of $-x + 2y$. Then group the like terms and add.

The additive inverse of $-x + 2y$ is $x - 2y$.

$(12x + 7y) - (-x + 2y)$
$= (12x + 7y) + (x - 2y)$
$= (12x + x) + (7y - 2y)$
$= 13x + 5y$

Try These Together

Find each sum or difference.

1.
$$\begin{array}{r} 7a + 3b - 4c \\ a + 9b + 4c \\ (+)\ -3a - 9b - 9c \\ \hline \end{array}$$

2.
$$\begin{array}{r} 2a^2 - 7a + 8 \\ 7a^2 \qquad - 2 \\ (+)\ a^2 - 2a + 1 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 5x^2 - 3x + 1 \\ (-)\ -4x^2 - 2x + 8 \\ \hline \end{array}$$

Hint: For Exercise 3, remember to add the opposite *of the second term in each column.*

PRACTICE

Find each sum or difference.

4. $(a^3 - 4b^3) + (2a^3 + 5a^2b - 6b^2 + 4b^3)$

5. $(2r - 8s) - (8r + 3s)$

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

7. $(33n + m) - 15m$

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

9. $(2c^2 - 9) - (4c^2 + 4c + 1)$

10. $(3q^3 + 8q) + (-5q^2 - 7q)$

11. $(5 + b + 2b^2) + (3 - 2b + 9b^2)$

12. $(5x^2y^2 - xy - 1) - (7xy + 2)$

13. $(5k^2 - 2) - (2k^2 + 6k + 1)$

14. $(6x^2 + xy - 5y^2) + (9x^2 + 4xy + 9y^2)$

15. $(ax^2 + 8ax) - (8ax^2 - 2ax + 9)$

The measure of two sides of a triangle are given. P represents the measure of the perimeter. Find the measure of the third side.

16. $2x - 2y, 4x - y, P = 7x + 5y$

17. $10x - 1, 8x^2 + 2, P = 15x^2 - 9x + 18$

18. **Standardized Test Practice** Find $(4x^2 + 4x - 3) - (x^2 - 8x + 2)$.

A $3x^2 + 12x - 5$ **B** $5x^2 - 4x - 1$ **C** $3x^2 - 4x - 1$ **D** $5x^2 + 12x - 5$

Answers: **1.** $5a + 3b - 9c$ **2.** $10a^2 - 9a + 7$ **3.** $9x^2 - x - 7$ **4.** $3a^3 + 5a^2b - 6b^2$ **5.** $-6r - 11s$ **6.** $x^2 + 8y - 5$ **7.** $33n - 14m$ **8.** $-8y^3 + 4y^2 + y + 6$ **9.** $-2c^2 - 4c - 10$ **10.** $3q^3 - 5q^2 + q$ **11.** $11b^2 - b + 8$ **12.** $5x^2y^2 - 8xy - 3$ **13.** $3k^2 - 6k - 3$ **14.** $15x^2 + 5xy + 4y^2$ **15.** $-7ax^2 + 10ax - 9$ **16.** $x + 8y$ **17.** $7x^2 - 19x + 17$ **18.** A