

## Oral Exercises

Name the similar monomials.

1.  $-2x, 2xy, 4y, x, -xy, -y$   
3.  $3a^4, -4a^3, a^2, 5a^3, 3a^2$

2.  $-st^2, 2s^2t, 3t^2s, -s^2t$   
4.  $x^2y^2, x^2, y^2, -3x^2y^2, -4x^2$

In Exercises 5–10, (a) state the degree of each variable in the monomial, and (b) state the degree of the monomial.

5.  $-5xy^4z^3$                       6.  $7ab^3c$                       7.  $-10xyz$   
8.  $-3a^5bc^2$                       9.  $n^2p^2q^2$                       10.  $-2u^4v^6w^2$

State the degree of each polynomial. If the polynomial is a binomial or a trinomial, say so.

11.  $3x^2 - 7x + 4$                       12.  $-2x^2 - 4x^3 + 6x - 5$                       13.  $x^3 - x^5$   
14.  $p^2q^3 - 3pq^4$                       15.  $r^2s - 3rs^3 + 2r^3s^2 + s^4$                       16.  $2s^2t + 3st^2 - s^2t^2$

Add.

17.  $\begin{array}{r} 2x - 5 \\ x + 3 \end{array}$                       18.  $\begin{array}{r} 4m - 3 \\ 3m + 1 \end{array}$                       19.  $\begin{array}{r} 5n + 6 \\ -2n + 1 \end{array}$   
20.  $\begin{array}{r} 4y - 2 \\ -3y - 9 \end{array}$                       21.  $\begin{array}{r} 3x^2 - 2x + 1 \\ x^2 - 2x + 3 \end{array}$                       22.  $\begin{array}{r} 3y^2 - 5 \\ 2y^2 - 3y + 4 \end{array}$   
23.  $\begin{array}{r} 6a - 4b + c \\ 4a + 4b + c \end{array}$                       24.  $\begin{array}{r} 1 - 2y + 3y^2 \\ 3 - 2y + y^2 \end{array}$                       25.  $\begin{array}{r} 3x^3 - 2x^2y + xy^2 \\ x^3 + x^2y - xy^2 \end{array}$

26–34. In Exercises 17–25, subtract the lower polynomial from the upper one.

Simplify.

35.  $(3x - 2y + 5) + (x + 2y - 2)$                       36.  $(2p - q + 1) + (-p - q + 3)$   
37.  $(5r - 2y) - (2r - 3y)$                       38.  $(3x + 3y - 5) - (2x - 2y + 5)$

## Written Exercises

Copy each polynomial and underline similar terms as was done in Example 1, page 146. Then simplify the polynomials.

- A** 1.  $3x - 2y - x - 3y$                       2.  $6m - 6n - 4m + n$   
3.  $3x^2 - 2x - 2x^2 - 4x - 3$                       4.  $n^2 - 4n - 3n^2 + 7n + 5n^2$   
5.  $a^2 + 3ab - 4ab + 3a^2$                       6.  $p^2q - q^3 - 3p^2q + 4q^3$   
7.  $r^2s - 3rs^2 + 4s^3 - 2r^2s - 3s^2$                       8.  $-3x^2 + 7x^2y - x^3 + xy^2 + 4x^3 - 3x^2y$

Add.

$$9. \begin{array}{r} 5y - 3 \\ \underline{2y + 9} \end{array}$$

$$12. \begin{array}{r} 7n - 6 \\ \underline{n + 4} \end{array}$$

$$15. \begin{array}{r} 2x^2 - 3x - 4 \\ \underline{3x^2 + 4x - 6} \end{array}$$

$$18. \begin{array}{r} 8p^2 - 5pq + 6q^2 \\ \underline{-2p^2 + 5pq - 4q^2} \end{array}$$

$$10. \begin{array}{r} 4x + 7 \\ \underline{x - 2} \end{array}$$

$$13. \begin{array}{r} 2r - 3x + 5 \\ \underline{-r + 3x - 2} \end{array}$$

$$16. \begin{array}{r} 4 - 3n - 5n^2 \\ \underline{-2 + n - 3n^2} \end{array}$$

$$19. \begin{array}{r} 3a - 7b - 5c + 2 \\ -a + 4b + c - 5 \\ \underline{2a \quad \quad + 3c + 3} \end{array}$$

$$11. \begin{array}{r} 3y + 8 \\ \underline{2y - 5} \end{array}$$

$$14. \begin{array}{r} -2p + 4q - 7 \\ \underline{-4p - 2q + 5} \end{array}$$

$$17. \begin{array}{r} 4x^2 - 3xy - 5y^2 \\ \underline{2x^2 + xy - 3y^2} \end{array}$$

$$20. \begin{array}{r} 7x - 6y + 4z - 1 \\ -3x + 3y - 5z + 3 \\ \underline{-2x - y + z - 4} \end{array}$$

21–30. In Exercises 9–18, subtract the lower polynomial from the upper one.

Simplify.

**Sample 1**  $(4x^2 + 2x - 5) + (-x^2 + 3x + 5) = (4x^2 - x^2) + (2x + 3x) + (-5 + 5)$   
 $= 3x^2 + 5x$  **Answer**

31.  $(2x - 5y + 2) + (5x + 6y - 7)$

33.  $(2x - 5) - (x - 2)$

35.  $(5x - 3t - 7) - (x - 2t - 3)$

37.  $(3n^2 + 5n - 6) + (-n^2 - 3n + 3)$

39.  $(3x^2 - 4x - 2) - (-x^2 - 4x + 7)$

32.  $(2p - 7q - 4) + (3q + 2p - 1)$

34.  $(3m + 5) - (-2m + 3)$

36.  $(a - 3b + 5) - (-a + 2b + 3)$

38.  $(y^2 + 6y - 5) + (-y^2 - 3y - 1)$

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

**B** 41.  $(u^3 - 3u^2v + 2uv^2) + (3u^2v - 2uv^2 - v^3)$

43.  $(3a^3 - 2ab^2) - (a^3 - 4ab^2 - b^3)$

42.  $(2x^2y - 3xy^2 - y^3) + (2x^2y - xy^2)$

44.  $(2p^2q - 3pq^2 + q^3) - (-p^2q + q^3)$

Solve.

**Sample 2**  $9x - (3x - 8) = 20$   
 $9x - 3x + 8 = 20$   
 $6x + 8 = 20$   
 $6x = 12$   
 $x = 2$

$\therefore$  the solution set is  $\{2\}$ . **Answer**

45.  $7x - (3x - 2) = 10$

47.  $(11n - 5) - (3n - 2) = -19$

49.  $(4y - 3) - (4 - y) = 3(y + 3)$

51.  $2 - 3x = 8(5 - x) - (x - 10)$

46.  $z - (4z - 5) = 8$

48.  $(2x + 3) - (5x - 7) = 1$

50.  $3(n - 2) - 2(3 - n) = 4(n - 3)$

52.  $3(4u - 6) = 2(4u - 3) - (u - 8)$

**C** 53.  $(2y^2 - y + 6) - 2(y^2 - 3y + 5) = 11$

55.  $x(3 - x) = x - (x^2 - 2x + 4)$

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

56.  $3 - 2x(x - 1) = x(3 - 2x) - (x - 3)$