A Practice by Example

Example 1 (page 457)

Find the degree of each monomial.

1. $4x$
2. $7c^3$
3. -16
4. $6y^2w^8$
5. $8ab^3$
6. 6
7. $-9x^4$
8. 11

Example 2 (page 457)

Name each expression based on its degree and number of terms.

9. $5x^2 - 2x + 3$
10. $\frac{3}{4}z + 5$
11. $7a^3 + 4a - 12$
12. $\frac{3}{x} + 5$
13. -15
14. $w^2 + 2$

Write each polynomial in standard form. Then name each polynomial based on its degree and number of terms.

15. $4x - 3x^2$
16. $4x + 9$
17. $c^2 - 2 + 4c$
18. $9z^2 - 11z^2 + 5z - 5$
19. $y - 7y^3 + 15y^8$
20. $-10 + 4q^4 - 8q + 3q^2$

Example 3 (page 458)

Simplify each sum.

21. $\begin{array}{r} 5m^2 + 9 \\ +\ 3m^2 + 6 \\ \hline \end{array}$
22. $\begin{array}{r} 3k - 8 \\ +\ 7k + 12 \\ \hline \end{array}$
23. $\begin{array}{r} w^2 + w - 4 \\ +\ 7w^2 - 4w + 8 \\ \hline \end{array}$
24. $(8x^2 + 1) + (12x^2 + 6)$
25. $(g^4 + 4g) + (9g^4 + 7g)$
26. $(a^2 + a + 1) + (5a^2 - 8a + 20)$
27. $(7y^3 - 3y^2 + 4y) + (8y^4 + 3y^2)$

Example 4 (page 458)

Simplify each difference.

28. $\begin{array}{r} 6c - 5 \\ -\ (4c + 9) \\ \hline \end{array}$
29. $\begin{array}{r} 2b + 6 \\ -(b + 5) \\ \hline \end{array}$
30. $\begin{array}{r} 7h^2 + 4h - 8 \\ -\ (3h^2 - 2h + 10) \\ \hline \end{array}$
31. $(17n^4 + 2n^3) - (10n^4 + n^3)$
32. $(24x^5 + 12x) - (9x^5 + 11x)$
33. $(6w^2 - 3w + 1) - (w^2 + w - 9)$
34. $(-5x^4 + x^2) - (x^3 + 8x^2 - x)$

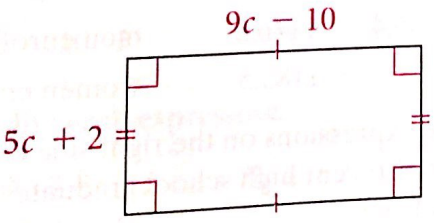
B Apply Your Skills

Simplify. Write each answer in standard form.

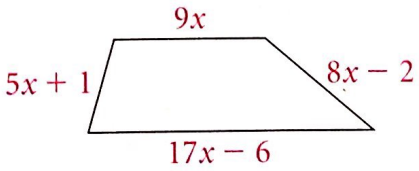
35. $(7y^2 - 3y + 4y) + (8y^2 + 3y^2 + 4y)$
36. $(2x^3 - 5x^2 - 1) - (8x^3 + 3 - 8x^2)$
37. $(-7z^3 + 3z - 1) - (-6z^2 + z + 4)$
38. $(7a^3 - a + 3a^2) + (8a^2 - 3a - 4)$

Geometry **Find the perimeter of each figure.**

39.



40.



Need Help?

Recall that the perimeter of a figure is the sum of all the sides of the figure.

41. **Error Analysis** Kwan's work is shown below. What mistake did he make?

$$\begin{aligned}(5x^2 - 3x + 1) - (2x^2 - 4x - 2) &= 5x^2 - 3x + 1 - 2x^2 - 4x - 2 \\ &= 5x^2 - 2x^2 - 3x - 4x + 1 - 2 \\ &= 3x^2 - 7x - 1\end{aligned}$$

42. a. Writing Write the definition of each word. Use a dictionary if nec
monogram binocular tricuspid polyglot
b. Open-Ended Find other words that begin with *mono*, *bi*, *tri*, or *pol*
c. Do these prefixes have meanings similar to those in mathematics?

Simplify. Write each answer in standard form.

43. $(x^3 + 3x) + (12x - x^4)$

44. $(6g - 7g^8) - (4g + 2g^3 +$

45. $(2h^4 - 5h^9) - (-8h^5 + h^{10})$

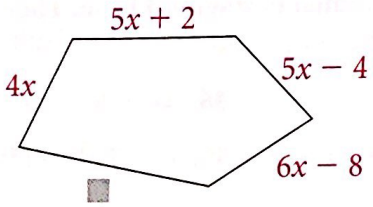
46. $(-4t^4 - 9t + 6) + (13t + 5t$

47. $(8b - 6b^7 + 3b^8) + (2b^7 - 5b^9)$

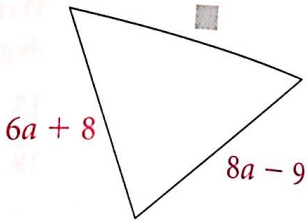
48. $(11 + k^3 - 6k^4) - (k^2 - k$

Geometry Find each missing length.

49. Perimeter $= 25x + 8$



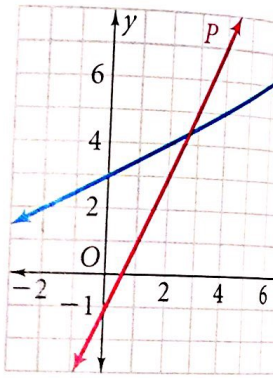
50. Perimeter $= 23a - 7$



51. Critical Thinking Is it possible to write a binomial with degree 0? Explain

Challenge

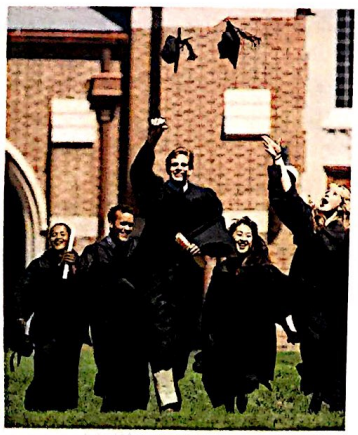
52. a. Write the equations for line P and line Q. Use slope-intercept form.
b. Use the expressions on the right side of each equation to write a function for the vertical distance $D(x)$ between points on lines P and Q with the same x-value.
c. For what value of x does $D(x)$ equal zero?
d. Critical Thinking How does the x-value in part (c) relate to the graph?



Simplify each expression.

53. $(ab^2 + ba^3) + (4a^3b - ab^2 - 5ab)$

54. $(9pq^6 - 11p^4q) - (-5pq^6 + p^4q$



Real-World Connection

There were about 12 million students enrolled in college in 1980, 13.8 million in 1990, and 15 million in 2000.

55. Graduation You can model the number of men and women in the United States who enrolled in college within a year of graduating from high school with the linear equations shown below. Let t equal the year of enrollment, wi $t = 0$ corresponding to 1990. Let $m(t)$ equal the number of men in thousands, and let $w(t)$ equal the number of women in thousands.

$m(t) = 35.4t + 1146.8$ men enrolled in college
$w(t) = 21.6t + 1185.5$ women enrolled in college

a. Add the expressions on the right side of each equation to model the total number of recent high school graduates $p(t)$ who enrolled in college betwee 1990 and 1998.
b. Use the equation you created in part (a) to find the number of high school graduates who enrolled in college in 1995.
c. Critical Thinking If you had subtracted the expressions on the right side of each equation above, what information would the resulting expression model?