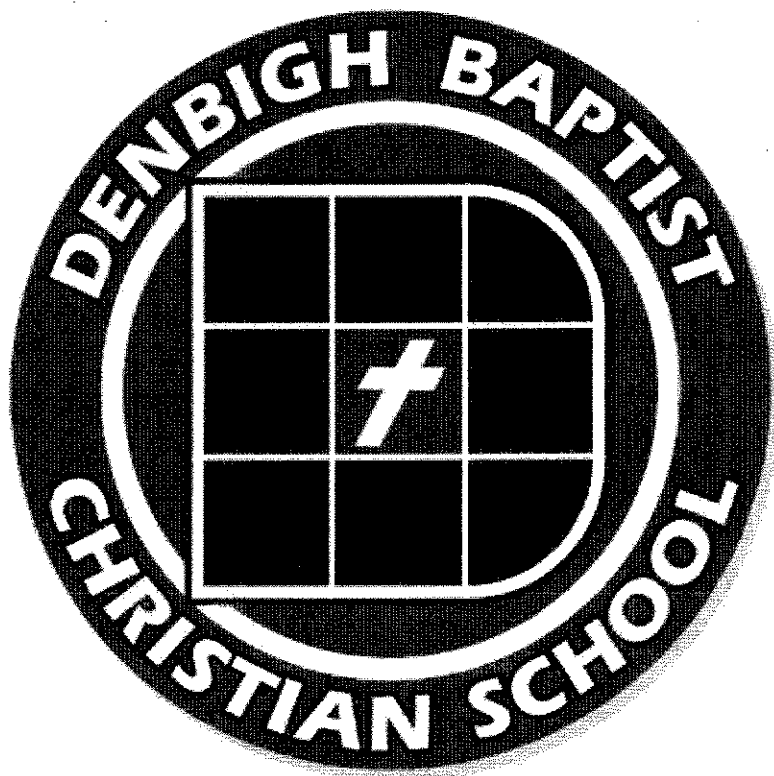Name: _____   Date: _____

DBCS

Geometry
Summer Packet

Dear Student,

Hooray! Summer vacation is here and the start of the new school year is just around the corner. I want you to be as prepared as possible for your first year in high school. It is important that you have a smooth transition to your new math class right at the beginning of the school year. With this in mind, I am providing a practice workbook of previously taught skills for you to complete over the summer.

It is your responsibility to complete the packet before the start of the school year. I am expecting to see all work **(DONE IN PENCIL)** to solve the problems in this packet attached on a separate piece of paper. Make sure to clearly box your final answer. Your signature at the bottom of the page signifies that you have completed all work to the best of your ability and tried your best to complete the packet. If you have trouble on some of the information, seek assistance from a parent/guardian or other adult who may be able to assist you. While this packet is not mandatory, it will be extremely helpful in maintaining the math skills needed to be successful in geometry. I will be offering extra credit to those that complete this packet in its entirety, show all their work, and follow directions.

Best wishes and I will see you soon!

Sincerely,
Mrs. Marshall

Dear Parent/Guardian,

It is important to me that your child has a smooth transition into a new math course. With this in mind, I am providing a practice workbook of previously taught skills for your child to complete over the summer. By doing so, it is my goal to increase your child's retention of mathematics' skills and to assure a clear understanding of expectations I have for students in the upcoming year in math.

Please encourage and monitor your child's completion of this workbook. Please make sure that **ALL WORK IS SHOWN** on attached paper. Remember, the goal is to work on it consistently throughout the summer and not to rush to finish it quickly. Students are to submit their workbooks to me the first day of school. The packet will be assessed for extra credit in the first quarter of geometry. Please sign and date the bottom of this document stating that your child has completed the summer math packet to the best of his/her ability.

A list of suggested supplies and resources is also attached to this summer packet. The math department uses graphing calculators in upper level high school math for classroom instruction, homework completion, and assessments. Students may choose to purchase their own to bring back and forth to school. A graphing calculator is recommended, although a scientific calculator will suffice for geometry. It is recommended that you purchase the calculator during the summer so that your child can become acquainted with it before school starts in the fall. Thank you for your support!

Suggested Math Supplies for Geometry Student:
- Pencils and red pens
- Graph paper and Notebook paper (refill as needed)
- Ruler, Protractor, Compass, and Scissors (at home use)
- Graphing Calculator- TI 83+/TI-84 or Scientific Calculator

Sincerely,
Mrs. Marshall

Please fill in the following information when the summer math packet is complete:

Student Signature	Grade:	Date:

Parent/Guardian Signature	Date

Algebra Review

EXAMPLE 1 *Determining Whether a Point is on a Line*

Decide whether $(3, -2)$ is a solution of the equation $y = 2x - 8$.

$-2 = 2(3) - 8$ Substitute 3 for x and -2 for y.

$-2 = -2$ Simplify.

The statement is true, so $(3, -2)$ is a solution of the equation $y = 2x - 8$.

EXERCISES

Decide whether the given ordered pair is a solution of the equation.

1. $y = 6x + 4; (-2, 8)$ **2.** $y = -10x - 2; (1, -12)$

3. $y = -\frac{1}{4}x - 18; (-4, -17)$ **4.** $y = \frac{3}{2}x + 10; (4, 12)$

5. $y = \frac{5}{9}x + 34; (-9, 27)$ **6.** $y = \frac{2}{3}x - 6; (9, 0)$

7. $y = \frac{4}{5}x - 2; (10, -3)$ **8.** $y = \frac{1}{2}x + 7; (4, 7)$

9. $2x - 3y = 10; (3, 4)$ **10.** $9x - y = -4; (-1, -5)$

11. $y - 6 = \frac{3}{4}x; (8, 12)$ **12.** $y + 5 = \frac{5}{3}x; (9, 10)$

EXAMPLE 2 *Calculating Slope*

Find the slope of a line passing through $(3, -9)$ and $(2, -1)$.

$m = \dfrac{y_2 - y_1}{x_2 - x_1}$ Formula for slope

$m = \dfrac{-1 - (-9)}{2 - 3} = \dfrac{-1 + 9}{-1}$ Substitute values and simplify.

$m = \dfrac{8}{-1} = -8$ Slope is -8.

EXERCISES

Find the slope of the line that contains the points.

13. $(4, 1), (3, 6)$ **14.** $(-8, 0), (5, -2)$ **15.** $(5, 6), (9, 8)$

16. $(0, -4), (7, -3)$ **17.** $(-1, 7), (-3, 18)$ **18.** $(-6, -4), (1, 10)$

19. $(4, -10), (-2, 2)$ **20.** $(11, 1), (-11, 1)$ **21.** $(14, -5), (5, 8)$

22. $(-7, 5), (-1, -1)$ **23.** $(-12, 8), (-3, -6)$ **24.** $(-9, 13), (2, -10)$

25. $(12, 3), (0, -4)$ **26.** $(9, -8), (-7, 10)$ **27.** $(2, -5), (6, -6)$

EXAMPLE 3 Finding the Equation of a Line

Find an equation of the line that passes through the point $(3, 4)$ and has a y-intercept of 5.

$y = mx + b$ Write the slope-intercept form.

$4 = 3m + 5$ Substitute 5 for b, 3 for x, and 4 for y.

$-1 = 3m$ Subtract 5 from each side.

$-\dfrac{1}{3} = m$ Divide each side by 3.

The slope is $m = -\dfrac{1}{3}$. The equation of the line is $y = -\dfrac{1}{3}x + 5$.

EXERCISES

Write the equation of the line that passes through the given point and has the given y-intercept.

28. $(2, 1); b = 5$ **29.** $(-5, 3); b = -12$ **30.** $(-3, 10); b = 8$

31. $(7, 0); b = 13$ **32.** $(-3, -3); b = -2$ **33.** $(-1, 4); b = -8$

34. $(-11, 8); b = -14$ **35.** $(4, -6); b = -2$ **36.** $(5, -8); b = 7$

37. $(-2, -1); b = -5$ **38.** $(2, 3); b = 2$ **39.** $(3, 0.5); b = 1.5$

EXAMPLE 4 Finding the Equation of a Line

Write an equation of the line that passes through the points $(4, 8)$ and $(3, 1)$.

Find the slope of the line.

$m = \dfrac{1 - 8}{3 - 4}$ Substitute values.

$m = \dfrac{-7}{-1} = 7$ Simplify.

$1 = 7(3) + b$ Substitute values into $y = mx + b$.

$1 = 21 + b$ Multiply.

$-20 = b$ Solve for b.

The equation of the line is $y = 7x - 20$.

EXERCISES

Write an equation of the line that passes through the given points.

40. $(6, -3), (1, 2)$ **41.** $(-7, 9), (-5, 3)$ **42.** $(5, -1), (4, -5)$

43. $(-2, 4), (3, -6)$ **44.** $(-3, -7), (0, 8)$ **45.** $(1, 2), (-1, -4)$

46. $(6, -2), (0, 4)$ **47.** $(-4, 3), (-3, -3)$ **48.** $(-3, 2), (-5, -2)$

49. $(10, -9), (14, -1)$ **50.** $(-1, -2), (5, 0)$ **51.** $(-6, 4), (6, -1)$

Algebra Review

EXAMPLE 1 · Distance Formula

Find the distance between
the points $(-4, 3)$ and $(-7, 8)$.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$= \sqrt{(-7 - (-4))^2 + (8 - 3)^2}$$
$$= \sqrt{(-3)^2 + (5)^2}$$
$$= \sqrt{34}$$

EXERCISES

Find the distance between the points.

1. $(3, 6), (0, -2)$ **2.** $(5, -2), (-6, 5)$ **3.** $(-3, 4), (1, 4)$

4. $(-6, -6), (-3, -2)$ **5.** $(8, -2), (-3, -6)$ **6.** $(-8, 5), (-1, 1)$

EXAMPLE 2 · Combining Like Terms

Simplify.

$8x^2 + 16xy - 3x^2 + 3xy - 3x$

$8x^2 - 3x^2 + 16xy + 3xy - 3x$ **Group like terms.**

$5x^2 - 3x + 19xy$ **Simplify.**

EXERCISES

Simplify.

7. $6x + 11y - 4x + y$ **8.** $-5m + 3q + 4m - q$ **9.** $-3p - 4t - 5t - 2p$

10. $9x - 22y + 18x - 3y$ **11.** $3x^2y - 5xy^2 + 6x^2y$ **12.** $5x^2 + 2xy - 7x^2 + xy$

EXAMPLE 3 · Solving Equations with Variables on Both Sides

Solve.

$6a - 12 = 5a + 9$

$a - 12 = 9$ **Subtract 5a from each side.**

$a = 21$ **Add 12 to each side.**

EXERCISES

Solve the equation.

13. $3x + 5 = 2x + 11$ **14.** $-14 + 3a = 10 - a$ **15.** $8m + 1 = 7m - 9$

16. $y - 18 = 6y + 7$ **17.** $2s + 1 = 7s + 1$ **18.** $3a - 12 = -6a - 12$

19. $-2t + 10 = -t$ **20.** $11q - 6 = 3q + 8q$ **21.** $-7x + 7 = 2x - 11$

EXAMPLE 4 *Solving Inequalities*

Solve.

a. $5x - 4 \geq 4x + 6$ **b.** $10 - 7x < 24$

When you multiply or divide each side of an inequality by a *negative* number, you must *reverse* the inequality symbol to maintain a true statement.

a. $5x - 4 \geq 4x + 6$ **b.** $10 - 7x < 24$

$\quad x - 4 \geq 6$ $-7x < 14$

$\quad\quad x \geq 10$ $x > -2$

EXERCISES

Solve the inequality.

22. $-x + 2 > 7$ **23.** $c - 18 < 10$ **24.** $-5 + m < 21$

25. $x - 5 < 4$ **26.** $z + 6 > -2$ **27.** $-3x + 4 \leq -5$

28. $5 - 2x < -3x - 6$ **29.** $-m + 3 \geq -4m + 6$ **30.** $2b + 4 > -3b + 7$

31. $13 - 6x > 10 + 4x$ **32.** $4z + 8 \leq 12$ **33.** $14 - 5t \geq 28$

34. $6 - 3r < 24$ **35.** $16 - 12x \leq 28$ **36.** $-3x + 11 \geq 32$

EXAMPLE 5 *Absolute Value Equations and Inequalities*

Solve.

a. $|x + 8| = 4$ **b.** $|x - 5| \geq 20$ **c.** $|x + 1| < 3$

$\quad x + 8 = 4 \ or$ $x - 5 \geq 20 \ or$ $x + 1 < 3 \ and$

$\quad x + 8 = -4$ $x - 5 \leq -20$ $x + 1 > -3$

$x = -4 \ or \ x = -12$ $x \geq 25 \ or \ x \leq -15$ $x < 2 \ and \ x > -4$

                                                           $-4 < x < 2$

EXERCISES

Solve.

37. $|x + 5| = 12$ **38.** $|x - 2| = 10$ **39.** $|5 - x| = 3$

40. $|1 - x| = 6$ **41.** $|x + 3| = 17$ **42.** $|-5x + 2| = 7$

43. $|2x - 3| = 11$ **44.** $|7x + 8| = 20$ **45.** $|-4x + 5| = 13$

46. $|3x + 8| = 4$ **47.** $|x + 13| \geq 23$ **48.** $|x - 6| > 8$

49. $|x - 2| \leq 8$ **50.** $|15 - x| \geq 7$ **51.** $|16 - x| < 4$

52. $|6x - 4| < 8$ **53.** $|-2x + 4| \leq 10$ **54.** $|9x - 6| \leq 21$

55. $|11x - 11| \geq 33$ **56.** $|2x + 3| > 13$ **57.** $|10x + 20| < 40$

58. $|4x - 6| > 14$ **59.** $|x + 2| \geq 4$ **60.** $|5x - 9| < 14$

61. $|11x + 1| > 21$ **62.** $|-7x - 2| \leq -21$ **63.** $|3x - 2| > 10$

64. $|12x + 16| \leq 20$ **65.** $|5x + 8| \geq -32$ **66.** $7 + |x + 1| \leq 8$

Algebra Review

EXAMPLE 1 *Writing and Simplifying Ratios*

a. Train A takes 35 minutes to travel its route. Train B, traveling the same route but making more stops, takes 47 minutes. What is the ratio of the time of Train A to Train B?

b. Jennie's height is 4 feet, 7 inches. Her younger sister's height is 25 inches. Find the ratio of Jennie's height to her sister's.

SOLUTIONS

a. 35 minutes to 47 minutes $= \dfrac{35 \text{ minutes}}{47 \text{ minutes}} = \dfrac{35}{47}$

b. Convert 4 feet, 7 inches to inches: $4(12) + 7 = 55$ inches

55 inches to 25 inches $= \dfrac{55 \text{ inches}}{25 \text{ inches}} = \dfrac{55}{25} = \dfrac{11}{5}$

EXERCISES

Write the following ratios.

1. Basmati rice needs to cook for 20 minutes, while quinoa (another grain) cooks for 25 minutes. What is the ratio of cooking times for rice to quinoa?

2. Jonathan caught 7 fish and Geogeanne caught 4. What is the ratio of fish caught of Jonathan to Geogeanne?

3. Two sunflowers' growth was measured daily. At the end of the experiment, Sunflower A had grown from 2 inches to 2 feet, 3 inches. Sunflower B had grown from 3 inches to 2 feet, 6 inches. Find the ratio of the growth in height of Sunflower A to Sunflower B.

4. A soccer team won 22 games and lost 8. What is their win-loss ratio?

5. Charlotte's essay on pigs was 824 words in length. Wilbur's essay was only 360 words long. What is the ratio of the length of Charlotte's essay to Wilbur's essay?

6. A gingham bed sheet has 220 threads per square inch while an embroidered white sheet has 180 threads per square inch. Find the ratio of threads per square inch of the gingham sheet to the white sheet.

Use the diagram at the right.

7. What is the ratio of length to width of rectangle *A*?

8. What is the ratio of the perimeter of rectangle *A* to the perimeter of rectangle *B*?

9. What is the ratio of the area of rectangle *A* to the area of rectangle *B*?
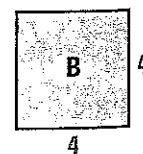
EXAMPLE 2 *Distributive Property*

Solve.

a. $4(x + 3) = 36$

$4x + 12 = 36$

$4x = 24$

$x = 6$

b. $6(x + 4) + 12 = 5(x + 3) + 7$

$6x + 24 + 12 = 5x + 15 + 7$

$6x + 36 = 5x + 22$

$x = -14$

EXERCISES

Solve.

10. $2(x + 7) = 20$

11. $8(x + 6) = 24$

12. $6(x - 2) = 24$

13. $-10(y + 8) = -40$

14. $16(3 - d) = -4$

15. $7(2 - x) = 5x$

16. $-4(x - 6) = 28$

17. $-9(5 - 3x) = 9$

18. $\frac{1}{2}(10 - 9x) = \frac{3}{2}$

19. $\frac{2}{3}(m + 4) - 8 = \frac{11}{3}$

20. $5(3a - 2) = 2(6a - 8)$

21. $3(x - 1) + 3 = 4(x - 2)$

EXAMPLE 3 *Solving Proportions*

Solve.

a. $\frac{x}{8} = \frac{3}{4}$

$4x = 8 \cdot 3$

$4x = 24$

$x = 6$

b. $\frac{6}{x + 4} = \frac{1}{9}$

$6 \cdot 9 = x + 4$

$54 = x + 4$

$50 = x$

EXERCISES

Solve.

22. $\frac{x}{20} = \frac{1}{5}$

23. $\frac{2}{q} = \frac{4}{18}$

24. $\frac{7}{100} = \frac{14}{y}$

25. $\frac{t}{27} = \frac{4}{9}$

26. $\frac{5}{6} = \frac{4}{r}$

27. $\frac{w}{6} = \frac{7}{17}$

28. $\frac{27}{5} = \frac{3}{z}$

29. $\frac{y}{50} = \frac{3}{100}$

30. $\frac{6}{19} = \frac{m}{95}$

31. $\frac{3}{8} = \frac{3}{2d}$

32. $\frac{6}{5m} = \frac{6}{25}$

33. $\frac{19}{x} = \frac{9}{5}$

34. $\frac{3w + 6}{28} = \frac{3}{4}$

35. $\frac{6}{45} = \frac{2z + 10}{15}$

36. $\frac{3a}{11} = \frac{54}{22}$

37. $\frac{-3}{8} = \frac{21}{2(y + 1)}$

38. $\frac{1}{18} = \frac{5}{-4(x - 1)}$

39. $\frac{3}{m + 4} = \frac{9}{14}$

40. $\frac{3}{p - 6} = \frac{1}{p}$

41. $\frac{r}{3r + 1} = \frac{2}{3}$

42. $\frac{w}{4} = \frac{9}{w}$

Algebra Review

EXAMPLE 1 Simplifying Radicals

Simplify the expression $\sqrt{20}$.

$$\sqrt{20} = \sqrt{4} \cdot \sqrt{5} \qquad \text{Use product property.}$$
$$= 2\sqrt{5} \qquad \text{Simplify.}$$

EXERCISES

Simplify the expression.

1. $\sqrt{121}$ 2. $\sqrt{52}$ 3. $\sqrt{45}$

4. $\sqrt{72}$ 5. $\sqrt{40}$ 6. $\sqrt{27}$

7. $\sqrt{80}$ 8. $\sqrt{50}$ 9. $\sqrt{243}$

10. $\sqrt{288}$ 11. $\sqrt{320}$ 12. $\sqrt{225}$

EXAMPLE 2 Simplifying Radical Expressions

Simplify the radical expression.

a. $5\sqrt{3} - \sqrt{3} - \sqrt{2}$ **b.** $(2\sqrt{2})(5\sqrt{3})$ **c.** $(5\sqrt{7})^2$

$\quad = 4\sqrt{3} - \sqrt{2}$ $\qquad\qquad = 2 \cdot 5 \cdot \sqrt{2} \cdot \sqrt{3} \qquad = 5^2\sqrt{7^2}$

$\qquad\qquad\qquad\qquad\qquad\qquad = 10\sqrt{6} \qquad\qquad = 25 \cdot 7$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad = 175$

EXERCISES

Simplify the radical expression.

13. $\sqrt{75} + \sqrt{3}$ 14. $\sqrt{50} - \sqrt{18}$ 15. $\sqrt{64} - \sqrt{28}$

16. $\sqrt{44} + 2\sqrt{11}$ 17. $\sqrt{125} - \sqrt{80}$ 18. $\sqrt{242} + \sqrt{200}$

19. $-\sqrt{147} - \sqrt{243}$ 20. $\sqrt{28} + \sqrt{63}$ 21. $\sqrt{20} + \sqrt{45} - \sqrt{5}$

22. $(\sqrt{13})(\sqrt{26})$ 23. $(3\sqrt{14})(\sqrt{35})$ 24. $(\sqrt{363})(\sqrt{300})$

25. $(6\sqrt{2})(2\sqrt{2})$ 26. $(\sqrt{18})(\sqrt{72})$ 27. $(\sqrt{21})(\sqrt{24})$

28. $(\sqrt{32})(\sqrt{2})$ 29. $(\sqrt{98})(\sqrt{128})$ 30. $(5\sqrt{4})(2\sqrt{4})$

31. $(6\sqrt{5})^2$ 32. $(4\sqrt{2})^2$ 33. $(8\sqrt{3})^2$

34. $(2\sqrt{3})^2$ 35. $(5\sqrt{5})^2$ 36. $(10\sqrt{11})^2$

EXAMPLE 3 *Simplifying Quotients with Radicals*

Simplify the quotient $\dfrac{6}{\sqrt{5}}$.

$$\dfrac{6}{\sqrt{5}} = \dfrac{6}{\sqrt{5}} \cdot \dfrac{\sqrt{5}}{\sqrt{5}}$$ **Multiply numerator and denominator by $\sqrt{5}$, to eliminate a radical in the denominator.**

$$= \dfrac{6\sqrt{5}}{\sqrt{5}\,\sqrt{5}}$$

$$= \dfrac{6\sqrt{5}}{5}$$

EXERCISES

Simplify the quotient.

37. $\dfrac{4}{\sqrt{3}}$ **38.** $\dfrac{5}{\sqrt{7}}$ **39.** $\dfrac{2\sqrt{3}}{\sqrt{6}}$ **40.** $\dfrac{2\sqrt{3}}{\sqrt{5}}$

41. $\dfrac{\sqrt{18}}{3\sqrt{2}}$ **42.** $\dfrac{4}{\sqrt{8}}$ **43.** $\dfrac{16}{\sqrt{24}}$ **44.** $\dfrac{\sqrt{5}}{\sqrt{10}}$

45. $\dfrac{4}{\sqrt{12}}$ **46.** $\dfrac{3\sqrt{5}}{\sqrt{20}}$ **47.** $\dfrac{9}{\sqrt{52}}$ **48.** $\dfrac{\sqrt{12}}{\sqrt{24}}$

49. $\dfrac{\sqrt{18}}{\sqrt{10}}$ **50.** $\dfrac{\sqrt{32}}{\sqrt{5}}$ **51.** $\dfrac{\sqrt{27}}{\sqrt{45}}$ **52.** $\dfrac{\sqrt{50}}{\sqrt{75}}$

EXAMPLE 4 *Solving Quadratic Equations*

Solve.

$$x^2 - 5 = 16$$

$$x^2 = 21 \qquad \text{**Add 5 to each side.**}$$

$$x = \pm\sqrt{21} \qquad \text{**Find square roots.**}$$

EXERCISES

Solve.

53. $x^2 = 9$ **54.** $x^2 = 625$ **55.** $x^2 = 289$

56. $x^2 + 3 = 13$ **57.** $x^2 - 4 = 12$ **58.** $x^2 - 7 = 6$

59. $7x^2 = 252$ **60.** $3x^2 = 192$ **61.** $6x^2 = 294$

62. $4x^2 + 5 = 45$ **63.** $2x^2 + 5 = 23$ **64.** $9x^2 + 7 = 52$

65. $11x^2 + 4 = 48$ **66.** $6x^2 - 3 = 9$ **67.** $10x^2 - 16 = -6$

68. $5x^2 - 6 = 29$ **69.** $8x^2 - 12 = 36$ **70.** $5x^2 - 61 = 64$

71. $x^2 + 3^2 = 5^2$ **72.** $7^2 + x^2 = 25^2$ **73.** $5^2 + 12^2 = x^2$

Algebra Review

EXAMPLE 1 *Solving Literal Equations*

Given the formula for the surface area of a right cylinder, solve for h.
$S = 2\pi r^2 + 2\pi rh$

$$S = 2\pi r(r + h) \qquad \text{or} \qquad S - 2\pi r^2 = 2\pi rh$$

$$\frac{S}{2\pi r} = r + h \qquad\qquad \frac{(S - 2\pi r^2)}{2\pi r} = h$$

$$\frac{S}{2\pi r} - r = h$$

EXERCISES

Solve the literal equation for the indicated variable. Assume variables are positive.

1. $A = \ell w; \; w$ **2.** $V = \frac{4}{3}\pi r^3; \; r$ **3.** $A = \frac{1}{2}bh; \; h$ **4.** $A = \frac{1}{2}h(b_1 + b_2); \; b_1$

5. $A = \pi r^2; \; r$ **6.** $C = 2\pi r; \; r$ **7.** $V = s^3; \; s$ **8.** $P = 2\ell + 2w; \; \ell$

9. $V = \ell wh; \; h$ **10.** $V = \pi r^2 h; \; h$ **11.** $S = 6s^2; \; s$ **12.** $a^2 + b^2 = c^2; \; b$

EXAMPLE 2 *Algebraic Expressions*

a. Write an expression for seven less than a number.
$x - 7$

b. Write an equation for three less than six times a number is five times the same number plus 5, then solve.
$6x - 3 = 5x + 5$
$x - 3 = 5$
$x = 8$

EXERCISES

Write the expression or equation. Solve the equations.

13. Five plus a number

14. A number squared increased by the square root of 2

15. Twice a number decreased by fourteen

16. Six less than three times a number

17. A number plus two decreased by nine times the number

18. Half of a number plus three times the number

19. The product of five and a number decreased by seven equals thirteen.

20. Sixteen less than twice a number is 10.

21. Twice a number increased by the product of the number and fourteen results in forty-eight.

22. Half of a number is three times the sum of the number and five.

EXAMPLE 3 *Percent Problems*

a. What number is 12% of 75?
$$x = 0.12(75)$$
$$x = 9$$

b. 6 is what percent of 40?
$$6 = 40p$$
$$0.15 = p$$
$$p = 15\%$$

EXERCISES

Solve.

23. What number is 30% of 120?

24. What distance is 15% of 340 miles?

25. What number is 71% of 200?

26. How much money is 50% of $25?

27. 34 is what percent of 136?

28. 11 dogs is what percent of 50 dogs?

29. 200 is what percent of 50?

30. 8 weeks is what percent of a year?

31. 3 is 30% of what number?

32. 16 meters is 64% of what distance?

33. If sales tax is 8%, how much tax is charged on a $25.95 purchase?

34. 15 out of 18 players on a team came to a tournament. What percent of the players were absent?

EXAMPLE 4 *Simplifying Rational Expressions*

Simplify.

a. $\dfrac{8x^2 + 12x}{4x^2 + 16x}$

$\dfrac{4x(2x + 3)}{4x(x + 4)}$

$\dfrac{2x + 3}{x + 4}$

b. $\dfrac{y^2 - 9}{y^2 + 6y + 9}$

$\dfrac{(y + 3)(y - 3)}{(y + 3)(y + 3)}$

$\dfrac{y - 3}{y + 3}$

EXERCISES

Simplify.

35. $\dfrac{5x}{10x^2}$

36. $\dfrac{16a^3}{8a}$

37. $\dfrac{(5x^2 + x)}{(5x + 1)}$

38. $\dfrac{9w^3 + 27w}{3w^3 + 9w}$

39. $\dfrac{5a + 10}{5a - 40}$

40. $\dfrac{5x^2 + 15x}{30x^2 - 5x}$

41. $\dfrac{14d^2 - 2d}{6d^2 + 8d}$

42. $\dfrac{2y - 12}{24 - 2y}$

43. $\dfrac{36s^2 - 4s}{4s^2 - 12s}$

44. $\dfrac{-5h + 1}{h + 1}$

45. $\dfrac{t^2 - 1}{t^2 + 2t + 1}$

46. $\dfrac{m^2 - 4m + 4}{m^2 - 4}$