

6-5

Practice

Form K

Solving Square Root and Other Radical Equations

Solve. To start, rewrite the equation to isolate the radical.

1. $\sqrt{x+2} - 2 = 0$

2. $\sqrt{2x+3} - 7 = 0$

3. $2 + \sqrt{3x-2} = 6$

$$\sqrt{x+2} = 2$$

Solve.

4. $2(x-2)^{\frac{2}{3}} = 50$

5. $2(x+3)^{\frac{3}{2}} = 54$

6. $(6x-5)^{\frac{1}{3}} + 3 = -2$

7. The formula $d = 2\sqrt{\frac{V}{\pi h}}$ relates the diameter d , in units, of a cylinder to its volume V , in cubic units, and its height h , in units. A cylindrical can has a diameter of 3 in. and a height of 4 in. What is the volume of the can to the nearest cubic inch?

8. **Writing** Explain the difference between a radical equation and a polynomial equation.

9. **Reasoning** If you are solving $4(x+3)^{\frac{3}{4}} = 7$, do you need to use the absolute value to solve for x ? Why or why not?

6-5

Practice (continued)

Form K

Solving Square Root and Other Radical Equations

Solve. Check for extraneous solutions. First, isolate a radical, then square each side of the equation.

10. $\sqrt{4x + 5} = x + 2$

11. $\sqrt{-3x - 5} - 3 = x$

12. $\sqrt{x + 7} + 5 = x$

$$(\sqrt{4x + 5})^2 = (x + 2)^2$$

13. $\sqrt{2x - 7} = \sqrt{x + 2}$

14. $\sqrt{3x + 2} - \sqrt{2x + 7} = 0$

15. $\sqrt{2x + 4} - 2 = \sqrt{x}$

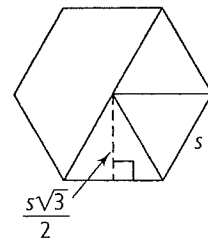
$$(\sqrt{2x - 7})^2 = (\sqrt{x + 2})^2$$

16. Find the solutions of $\sqrt{x + 2} = x$.

a. Are there any extraneous solutions?

b. **Reasoning** How do you know the answer to part (a)?

17. A floor is made up of hexagon-shaped tiles. Each hexagon tile has an area of 1497 cm^2 . What is the length of each side of the hexagon?
(Hint: Six equilateral triangles make one hexagon.)



8-3

Practice

Form K

Rational Functions and Their Graphs

Find the domain, points of discontinuity, and x - and y -intercepts of each rational function. Determine whether the discontinuities are removable or non-removable. To start, factor the numerator and denominator, if possible.

1. $y = \frac{x+5}{x-2}$

2. $y = \frac{1}{x^2 + 2x + 1}$

3. $y = \frac{x+4}{x^2 + 2x - 8}$

Find the vertical asymptotes and holes for the graph of each rational function.

4. $y = \frac{x+6}{x+4}$

5. $y = \frac{(x-2)(x-1)}{x-2}$

6. $y = \frac{x+1}{(3x-2)(x-3)}$

Find the horizontal asymptote of the graph of each rational function. To start, identify the degree of the numerator and denominator.

7. $y = \frac{x+1}{x+5}$

8. $y = \frac{x+2}{2x^2-4}$

9. $y = \frac{3x^3-4}{4x+1}$

$$\frac{x+1}{x+5} \leftarrow \text{degree 1}$$

$$\frac{x+1}{x+5} \leftarrow \text{degree 1}$$

Sketch the graph of each rational function.

10. $y = \frac{x+2}{(x+3)(x-4)}$

11. $y = \frac{x+3}{(x-1)(x-5)}$

12. $y = \frac{2x}{3x-1}$

8-3

Practice (continued)

Form K

Rational Functions and Their Graphs

13. The CD-ROMs for a computer game can be manufactured for \$.25 each. The development cost is \$124,000. The first 100 discs are samples and will not be sold.
- Write a function for the average cost of a disc that is not a sample.
 - What is the average cost if 2000 discs are produced? If 12,800 discs are produced?
 - Reasoning** How could you find the number of discs that must be produced to bring the average cost under \$8?
 - How many discs must be produced to bring the average cost under \$8?

14. **Error Analysis** For the rational function $y = \frac{x^2 - 2x - 8}{x^2 - 9}$, your friend said that the vertical asymptote is $x = 1$ and the horizontal asymptotes are $y = 3$ and $y = -3$. Without doing any calculations, you know this is incorrect. Explain how you know.

Sketch the graph of each rational function.

15. $y = \frac{4x^2 - 100}{2x^2 + x - 15}$

16. $y = \frac{2x^2}{5x + 1}$

17. $y = \frac{2}{x^2 - 4}$

18. **Multiple Choice** What are the points of discontinuity for the graph of

$$y = \frac{(2x + 3)(x - 5)}{(x + 5)(2x - 1)}?$$

(A) -5, 1

(B) $-\frac{3}{2}, 5$

(C) $-5, \frac{1}{2}$

(D) $5, -\frac{1}{2}$