Name _____ Date _____ Class _____

LESSON 11-3

Solving Radical Equations

Practice and Problem Solving: A/B

Solve each equation.

1. $\sqrt{x+6}=7$

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

3. $\sqrt{2x+5}=\sqrt{3x-1}$

4. $\sqrt{x+4}=3\sqrt{x}$

5. $\sqrt[3]{x-6}=\sqrt[3]{3x+24}$

6. $3\sqrt[3]{x}=\sqrt[3]{7x+5}$

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

8. $(x+4)^{\frac{1}{2}}=6$

9. $4(x-3)^{\frac{1}{2}}=8$

10. $4(x-12)^{\frac{1}{3}}=-16$

11. $\sqrt{3x+6}=3$

12. $\sqrt{x-4}+3=9$

13. $\sqrt{x+7}=\sqrt{2x-1}$

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

Solve.

15. A biologist is studying two species of animals in a habitat. The population, p_1, of one of the species is growing according to $p_1=500t^{\frac{3}{2}}$ and the population, p_2, of the other species is growing according to $p_2=100t^2$, where time, t, is measured in years. After how many years will the populations of the two species be equal?

Reading Strategies

1. Quotient of Powers Property
2. Product Property of Roots
3. Power of a Product Property
4. Power of a Quotient Property

Success for English Learners

1. The expression had $x^{\frac{3}{4}}$ in the numerator and $x^{\frac{1}{2}}$ in the denominator. The Quotient of Powers Property combines these to $x^{\frac{3}{4}-\frac{1}{2}}$.
2. Possible answer: By writing the radical as a rational exponent, I could simplify the exponent to 2, so the expression was easy to simplify.

LESSON 11-3

Practice and Problem Solving: A/B

1. $x = 43$
2. $x = 20$
3. $x = 6$
4. $x = \frac{1}{2}$
5. $x = -15$
6. $x = \frac{1}{4}$
7. No solutions, since both -1 and -7 are extraneous.
8. $x = 32$
9. $x = 7$
10. $x = -52$
11. $x = 1$
12. $x = 40$
13. $x = 8$
14. no solution
15. 25 years

Practice and Problem Solving: C

1. $x = 31$
2. $x = 47$
3. $x = 7$
4. $x = 9$
5. $x = -2$ and $x = 1$
6. $x = 5$
7. $x = \frac{5}{2}$
8. $x = 9$; $x = -2$ is an extraneous solution.
9. $x = 1$
10. $x = 5$
11. $x = 16$
12. $x = -21$
13. $x = 4$
14. $x = 123$
15. $v = \frac{\sqrt{3}}{2}c$

Practice and Problem Solving: Modified

1. $\sqrt{x} = 6$
2. $\sqrt{3x} = x - 8$
3. $\sqrt{2x+1} = 3x + 17$
4. 2; $x = 16$
5. 4; $x = 6912$
6. 3; $x = 63$
7. $x = 2$; no extraneous solutions
8. $x = 1$, $x = 6$; $x = 1$ is an extraneous solution.
9. $x = 23$
10. $x = 9$
11. $x = 26$
12. $x = 28$
13. Ainsley is correct. Ben forgot to check for extraneous solutions. The only solution to the equation is $x = 2$.

Reading Strategies

1. $\sqrt{x} = -3$
2. $\sqrt{x+2} = 6$
3. $\sqrt{x} = -2$
4. $\sqrt{x} = 18$
5. $\sqrt{x+6} = 2$
6. Third power
7. Second power