LESSON 12.3

NAME _____ DATE _____

Challenge: Skills and Applications

For use with pages 722–728

In Exercises 1–6, solve the equation. Check the extraneous solutions.

Example: $\sqrt{x} - 7 = \sqrt{x - 7}$

Solution: $x - 14\sqrt{x} + 49 = x - 7$

$-14\sqrt{x} = -56 \Rightarrow \sqrt{x} = 4 \Rightarrow x = 16$

Check: $\sqrt{16} - 7 = \sqrt{16 - 7}$

$4 - 7 = \sqrt{9}$

$-3 \neq 3$

There is no solution.

1. $\sqrt{x + 5} = \sqrt{2x - 13}$

2. $\sqrt{x^2 + 7x - 9} = \sqrt{x^2 + 4x + 12}$

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

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

5. $\sqrt{x} - 1 = \sqrt{x - 7}$

6. $\sqrt{x} - 4 = \sqrt{x - 8}$

7. If the geometric mean of x and $2x$ is 6, what is the value of x?

8. If the geometric mean of x and $3x$ is 6, what is the value of x?

9. If the geometric mean of x and $4x$ is 6, what is the value of x?

10. Given that the geometric mean of x and ax is 6 and $a > 0$, as a increases does the absolute value is x increase or decrease?

In Exercises 11 and 12, use the following information.

Melissa Winston and George Gilsen are designing rectangular boxes with bases that are square. They have 17.1 square meters of cardboard to use for the faces of each box. The length of a side of the square base of a box s can be modeled by $s = -h + \sqrt{h^2 + 8.55}$, where h is the height of the box in meters.

11. Find the length of a side of a box's base when the height is 1.5 meters.

12. Find the height of a box when the length of a base side is 1.5 meters.