Name ______________________________ Date __________

5.4 Extra Practice

In Exercises 1–15, solve the equation. Check your solution(s).

1. $\sqrt[3]{x - 14} = -2$
2. $-5\sqrt{16x} + 17 = -8$
3. $\frac{1}{4}\sqrt[3]{2x} + 8 = 6$
4. $\sqrt{3x} - \frac{3}{4} = 0$
5. $3\sqrt[5]{x} + 9 = 15$
6. $\sqrt[4]{8x} - 16 = -12$
7. $\sqrt{10x + 24} = x + 12$
8. $x + 3 = \sqrt{\frac{22}{3}x + 9}$
9. $\sqrt[4]{2 - 25x^2} = 5x$
10. $\sqrt{4x - 4} - \sqrt{x + 8} = 0$
11. $\sqrt[3]{4x - 1} = \sqrt[3]{6x + 5}$
12. $\sqrt{4x - 10} = \sqrt{2x - 13} + 1$
13. $3x^{2/3} - 30 = 18$
14. $(6x + 8)^{1/2} - 3x = 0$
15. $(2x^2 + 8)^{1/4} = x$

In Exercises 16–18, solve the inequality.

16. $4\sqrt{x} + 3 \le 23$
17. $\sqrt{x + 10} \ge 6$
18. $-3\sqrt{x + 2} < 15$

19. "Hang time" is the time you are suspended in the air during a jump. Your hang time t (in seconds) is represented by $t = 0.5\sqrt{h}$, where h is the height (in feet) of the jump. A kite sailor has a hang time of 2.5 seconds. What is the height of the kite sailor's jump?

In Exercises 20–23, solve the nonlinear system. Justify your answer with a graph.

20. $y^2 = x + 2$
    $y = x + 2$
21. $y^2 = -x + 7$
    $y = x - 1$
22. $x^2 + y^2 = 9$
    $y = x - 3$
23. $x^2 + y^2 = 16$
    $y = x + 4$

24. The speed s (in miles per hour) of a car can be given by the formula $s = \sqrt{30fd}$, where f is the coefficient of friction and d is the stopping distance (in feet). The coefficient of friction for a snowy road is 0.30. You are driving 20 miles per hour and approaching an intersection. How far away from the intersection must you begin to brake?

Name ______________________________ Date __________

5.5 Extra Practice

In Exercises 1 and 2, find $(f + g)(x)$ and $(f - g)(x)$ and state the domain of each. Then evaluate $f + g$ and $f - g$ for the given value of x.

1. $f(x) = \sqrt[3]{4x};\ g(x) = -9\sqrt[3]{4x};\ x = -2$

2. $f(x) = 3x - 5x^2 - x^3;\ g(x) = 6x^2 - 4x;\ x = -1$

In Exercises 3–5, find $(fg)(x)$ and $\left(\frac{f}{g}\right)(x)$ and state the domain of each. Then evaluate fg and $\frac{f}{g}$ for the given value of x.

3. $f(x) = 3x^3;\ g(x) = \sqrt[3]{x^2};\ x = -8$

4. $f(x) = 3x^2;\ g(x) = 5x^{1/4};\ x = 16$

5. $f(x) = 10x^{5/6};\ g(x) = 2x^{1/3};\ x = 64$

In Exercises 6 and 7, use technology to evaluate $(f + g)(x)$, $(f - g)(x)$, $(fg)(x)$, and $\left(\frac{f}{g}\right)(x)$ when $x = 5$. Round your answers to two decimal places.

6. $f(x) = -3x^{1/3};\ g(x) = 4x^{1/2}$

7. $f(x) = 6x^{3/4};\ g(x) = 3x^{1/2}$

8. Describe and correct the error in stating the domain.

> ✗ $f(x) = 4x^{7/3}$ and $g(x) = 2x^{2/3}$
>
> The domain of $\left(\frac{f}{g}\right)(x)$ is all real numbers.

9. The table shows the outputs of the two functions f and g. Use the table to evaluate $(f + g)(5)$, $(f - g)(0)$, $(fg)(3)$, and $\left(\frac{f}{g}\right)(2)$.

x	0	1	2	3	4	5
$f(x)$	18	13	8	3	−2	−7
$g(x)$	64	32	16	8	4	2