Name_____ Date_____

5.1 Extra Practice

In Exercises 1–3, find the indicated real *n*th root(s) of *a*.

1. $n = 3,\ a = -343$ **2.** $n = 2,\ a = -400$ **3.** $n = 6,\ a = 64$

In Exercises 4–11, evaluate the expression without using technology.

4. $64^{1/2}$ **5.** $625^{1/4}$ **6.** $32^{7/5}$ **7.** $16^{3/4}$

8. $(-27)^{1/3}$ **9.** $(-32)^{3/5}$ **10.** $49^{-3/2}$ **11.** $1000^{-2/3}$

In Exercises 12–15, evaluate the expression using technology. Round your answer to two decimal places, if necessary.

12. $\sqrt[5]{15{,}013}$ **13.** $3975^{1/7}$ **14.** $(-18)^{-3/5}$ **15.** $\left(\sqrt[6]{3}\right)^5$

In Exercises 16–21, find the real solution(s) of the equation. Round your answer to two decimal places, if necessary.

16. $6x^3 = -6$ **17.** $(x - 9)^2 = 10$

18. $2(x + 5)^4 = 128$ **19.** $x^5 - 32 = -64$

20. $-\frac{1}{4}x^5 = 256$ **21.** $-\frac{1}{10}x^3 + 100 = 0$

22. Between which two consecutive integers does $\sqrt[5]{2000}$ lie? Explain your reasoning.

23. The volume of a cube is 1728 cubic inches. What is the side length of the cube?

24. A cone has a height of 6 meters, a radius of r meters, and a volume of 57 cubic meters. What is the radius of the cone?

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5.2 Extra Practice

In Exercises 1–4, use the properties of rational exponents to simplify the expression.

1. $\left(2^3 \cdot 3^3\right)^{-1/3}$

2. $\dfrac{10}{10^{-4/5}}$

3. $\left(\dfrac{52^5}{4^5}\right)^{1/6}$

4. $\dfrac{3^{1/3} \cdot 27^{2/3}}{8^{4/3}}$

In Exercises 5–7, use the properties of radicals to simplify the expression.

5. $\sqrt[6]{25} \cdot \sqrt[6]{625}$

6. $\dfrac{\sqrt{343}}{\sqrt{7}}$

7. $\dfrac{\sqrt[3]{25} \cdot \sqrt[3]{10}}{\sqrt[3]{2}}$

In Exercises 8–11, write the expression in simplest form.

8. $\sqrt[7]{384}$

9. $\sqrt[3]{\dfrac{5}{9}}$

10. $\dfrac{1}{4 - \sqrt{5}}$

11. $\dfrac{\sqrt{2}}{1 + \sqrt{6}}$

In Exercises 12–15, simplify the expression.

12. $-2\sqrt[3]{5} + 40\sqrt[3]{5}$

13. $2(1250)^{1/4} - 5(32)^{1/4}$

14. $\sqrt[5]{64a^{25}b^5}$

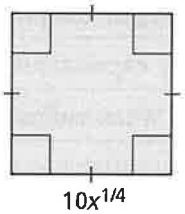
15. $\sqrt[6]{\dfrac{k}{h^{24}k^7}}$

In Exercises 16 and 17, write the expression in simplest form. Assume all variables are positive.

16. $\dfrac{\sqrt[4]{x} \cdot \sqrt[4]{81x}}{\sqrt[4]{16x^{36}}}$

17. $\dfrac{21\left(x^{-3/2}\right)\left(\sqrt{y}\right)\left(z^{5/2}\right)}{7^{-1}\sqrt{x}\left(y^{-1/2}\right)z}$

18. Find simplified expressions for the perimeter and area of the given figure.



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5.3 Extra Practice

In Exercises 1 and 2, graph the function. Find the domain and range of each function.

1. $f(x) = \sqrt[3]{-3x} + 1$

2. $g(x) = 2(x - 5)^{1/2} - 4$

In Exercises 3 and 4, describe the transformation of *f* represented by *g*. Then graph each function.

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

4. $f(x) = \sqrt[4]{x}$; $g(x) = -\sqrt[4]{2x} - 5$

5. Let g be a horizontal shrink by a factor of $\frac{5}{6}$, followed by a translation 10 units to the left of the graph of $f(x) = \sqrt[3]{15x + 1}$. Write a rule for g.

6. Use radical functions to graph $8x = y^2 + 5$. Identify the vertex and the direction that the parabola opens.

7. Use radical functions to graph $9x^2 + 9y^2 = 1$. Identify the radius and the intercepts.

8. The graph of a radical function f passes through the points $(-3, 0)$ and $(-2, 2)$. Write two different functions that can represent $f(x - 2) - 3$.