5-1 Additional Practice

*n*th Roots, Radicals, and Rational Exponents

Find the specified roots of each number.

1. real fourth roots of 625

−5 and 5

2. real cube roots of 125

5

Explain what the fractional exponent means, then evaluate.

3. $144^{\frac{1}{2}}$

Take square root of 144; 12

4. $121^{\frac{3}{2}}$ **Take square root of 121. Then raise the result to 3; 1,331**

What are the values of each expression? Round to the nearest hundredth.

5. $-\left(64^{\frac{5}{6}}\right)$

−32

6. $\sqrt[4]{(4.6)^3}$

3.14

Rewrite using a fractional exponent.

7. $\sqrt[3]{-27m^3n^6}$

$-3mn^2$

8. $\sqrt[4]{625x^8y^{28}}$

$5x^2|y^7|$

9. $\sqrt[6]{49^2}$

$7^{\frac{2}{3}}$

Solve the equations.

10. $7x^3 = 189$

$x = 3$

11. $199{,}927 = 7x^4$

$x = \pm 13$

12. One cube has an edge length 5 cm shorter than the edge length of the second cube. The volume of the smaller cube is 216 cm^3. What is the volume of the larger cube? **1,331 cm^3**

13. Describe and correct the error a student made in writing this expression in radical form.

$x^{\frac{4}{5}} = (x4)^{\frac{1}{5}}$

$(x4)^{\frac{1}{5}} = \sqrt[4]{x^5}$

The 4 and 5 in the last radical should be interchanged.

14. A water-walking ball has a volume of approximately 904.32 ft^3. What is the radius of the ball?

$\left(V = \frac{4}{3}\pi r^3\right)$ **6 feet**

15. Jeanne's bank account earns interest annually. The equation below shows her starting balance of $400 and her balance at the end of five years, $535.29. At what rate *r* did Jeanne earn interest?

$535.29 = 400(1 + r)^5$ **$r = 6\%$**