5-1 Additional Practice

nth Roots, Radicals, and Rational Exponents

Find the specified roots of each number.

1. real fourth roots of 625

2. real cube roots of 125

Explain what the fractional exponent means, then evaluate.

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

4. $121^{\frac{3}{2}}$

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

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

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

Rewrite using a fractional exponent.

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

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

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

Solve the equations.

10. $7x^3 = 189$

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

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?

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

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

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

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

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?

$$535.29 = 400(1 + r)^5$$

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

−3mn²

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

5x²|y⁷|

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

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

Solve the equations.

10. $7x^3 = 189$

x = 3

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

x = ±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 cm³. What is the volume of the larger cube? **1,331 cm³**

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

$x^{\frac{4}{5}} = (x^4)^{\frac{1}{5}}$ **The 4 and 5 in the last radical should be interchanged.**
$(x^4)^{\frac{1}{5}} = \sqrt[4]{x^5}$

14. A water-walking ball has a volume of approximately 904.32 ft³. 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%**