

Find all real roots.

2. cube roots of 27

3. fourth roots of 625

4. cube roots of 0

Simplify each expression. Assume that all variables are positive.

5.  $\sqrt[3]{8x^3}$

6.  $\sqrt[4]{\frac{32}{x^4}}$

7.  $\sqrt[3]{\frac{125x^6}{6}}$

8.  $\sqrt{50x^3}$

9.  $\sqrt[4]{x^8} \cdot \sqrt[3]{x^4}$

10.  $\sqrt[3]{\frac{x^5}{4}}$

11.  $\frac{\sqrt{40x^4}}{\sqrt[3]{-x^3}}$

12.  $\sqrt[4]{\frac{x^{12}y^4}{3}}$

Write each expression in radical form, and simplify.

13.  $36^{\frac{3}{2}}$

14.  $32^{\frac{3}{5}}$

15.  $(-27)^{\frac{1}{3}}$

16.  $8^{\frac{2}{3}}$

Write each expression by using rational exponents.

17.  $\sqrt[5]{9^{10}}$

18.  $\sqrt[3]{8^3}$

19.  $(\sqrt[5]{5})^3$

20.  $(\sqrt[3]{27})^2$

Simplify each expression.

21.  $13^{\frac{1}{2}} \cdot 13^{\frac{3}{2}}$

22.  $\frac{9^{\frac{4}{3}}}{9^{\frac{2}{3}}}$

23.  $(64^{\frac{1}{2}})^{\frac{1}{3}}$

24.  $(\frac{8}{27})^{\frac{1}{3}}$

25.  $25^{-\frac{1}{2}}$

26.  $7^{\frac{1}{4}} \cdot 7^{-\frac{3}{4}}$

27.  $(-125)^{-\frac{1}{3}}$

28.  $(6^{\frac{1}{2}})^6$

29. **Geometry** The side length of a cube can be determined by finding the cube root of the volume. What is the side length to the nearest *inch* of the cube shown?

