

7-5

Practice

Form K

Rational Exponents and Radicals

What is the value of each expression? The first one has been started for you.

1. $\sqrt{36} = \sqrt{6 \cdot 6}$ 6

2. $\sqrt{100}$ 10

3. $\sqrt[3]{64}$ 4

4. $\sqrt[3]{125}$ 5

5. $\sqrt[3]{1}$ 1

6. $\sqrt[4]{256}$ 4

Write each expression in radical form. The first one has been started for you.

7. $x^{\frac{1}{2}} = \sqrt{x^1}$ \sqrt{x}

8. $(25x^2)^{\frac{1}{2}}$ $5x$

9. $x^{\frac{2}{3}}$ $\sqrt[3]{x^2}$

10. $15x^{\frac{3}{4}}$ $15\sqrt[4]{x^3}$

11. $(27x^3)^{\frac{1}{3}}$ $3x$

12. $16t^{\frac{1}{5}}$ $16\sqrt[5]{t}$

Write each expression in exponential form.

13. $\sqrt[3]{x}$ $x^{\frac{1}{3}}$

14. $\sqrt{a^3}$ $a^{\frac{3}{2}}$

15. $\sqrt{16a}$ $4a^{\frac{1}{2}}$

16. $\sqrt{(49w)^2}$ $49w$

17. $\sqrt[3]{125d^2}$ $5d^{\frac{2}{3}}$

18. $\sqrt{(2m)^4}$ $4m^2$

7-5

Practice (continued)

Form K

Rational Exponents and Radicals

Simplify each expression using the properties of exponents, and then write the expression in radical form.

19. $\left(x^{\frac{1}{3}}\right)\left(x^{\frac{2}{3}}\right) x$

20. $\left(a^{\frac{1}{5}}\right)\left(a^{\frac{3}{5}}\right) \sqrt[5]{a^4}$

21. $(ab)^{\frac{1}{3}}(b)^{\frac{1}{3}} \sqrt[3]{ab^2}$

22. $(16x)^{\frac{1}{2}}\left(x^{\frac{1}{3}}\right) 4\sqrt[6]{x^5}$

Write each expression in exponential form. Simplify when possible.

23. $2\sqrt[3]{a} + 3\sqrt[3]{a} 5a^{\frac{1}{3}}$

24. $3\sqrt[4]{b} - \sqrt[3]{b} 3b^{\frac{1}{4}} - b^{\frac{1}{3}}$

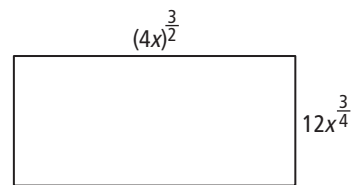
25. **Error Analysis** A student simplifies the expression $(64x)^{\frac{2}{3}}$ as follows:

$(64x)^{\frac{2}{3}} = \sqrt[3]{(64x)^2} = \sqrt[3]{4096x^2} = 16x^{\frac{2}{3}}$. What mistake did the student make in simplifying the expression? What is the correct simplification?

The student simplified $\sqrt[3]{x^2}$ incorrectly. The correct simplification is $16x^{\frac{2}{3}}$.

26. **Geometry** Find the area of the figure. Write the answer in radical form.

$96\sqrt[4]{x^9}$ square units



27. **Reasoning** Show that $\sqrt[3]{x^3} = x$ by rewriting $\sqrt[3]{x^3}$ in exponential form.

$$\sqrt[3]{x^3} = x^{\frac{3}{3}} = x^1 = x$$