Solutions

Lesson 4 Practice Problems

1. Evaluate $8^{\frac{5}{3}}$. $= \left(\sqrt[3]{8}\right)^5 = 2^5 = 32$

2. Select **all** expressions that are equal to $64^{\frac{3}{2}}$. $= \left(\sqrt[2]{64}\right)^3 = 8^3 = 512$

   A. 96

   B. 8^3

   C. 512

   D. 4^2

   E. $\sqrt{64^3}$

   F. $\sqrt[3]{64}^2$

3. Write the expression $17^{\frac{4}{3}}$ using radicals. $\sqrt[3]{17^4}$

4. An arithmetic sequence k starts 4, 13, ... Explain how you would calculate the value of the 5,000th term.

   $a_1 = 4$

   $d = 9$ (+9)

   $K_{5000} = 4 + 9(5000-1)$

(From Unit 1, Lesson 8.)

5. Select **all** items equivalent to $\sqrt{24}$.

A. the area of a square with side length 24 units

B. the side length of a square with area 24 square units

C. the positive number x, where $x \cdot x = 24$

D. the positive number y, where $y = 24 \cdot 24$

E. the edge length of a cube with volume 24 cubic units

F. the volume of a cube with edge length 24 units

(From Unit 3, Lesson 2.)

6. Which expression is equivalent to $23^{\frac{1}{2}}$?

A. $\frac{1}{23}$

B. $\frac{1}{\sqrt{23}}$

C. 11.5

D. $\sqrt{23}$

(From Unit 3, Lesson 3.)

Lesson 5 Practice Problems

1. Write each expression in the form a^b, without using any radicals.

   a. $\sqrt{5^9}$ = $5^{\frac{9}{2}}$

   b. $\frac{1}{\sqrt[3]{12}}$ = $12^{-\frac{1}{3}}$

2. Write $32^{-\frac{2}{5}}$ without using exponents or radicals.

   $= \frac{1}{(\sqrt[5]{32})^2} = \frac{1}{2^2} = \frac{1}{4}$

3. Match the equivalent expressions.

   A. $8^{\frac{1}{3}}$ 5. 2

   B. $8^{-\frac{1}{3}}$ 3. $\frac{1}{2}$

   C. 8^{-1} 1. $\frac{1}{8}$

   D. $16^{\frac{1}{2}}$ 6. 4

   E. $16^{-\frac{1}{2}}$ 2. $\frac{1}{4}$

   F. 16^0 4. 1

   1. $\frac{1}{8}$
   2. $\frac{1}{4}$
   3. $\frac{1}{2}$
   4. 1
   5. 2
   6. 4

4. Complete the table. Use powers of 27 in the top row and radicals or rational numbers in the bottom row.

27^1	$27^{\frac{1}{2}}$	$27^{\frac{1}{3}}$	27^0	$27^{-\frac{1}{2}}$	$27^{-\frac{1}{3}}$
27	$\sqrt{27}$	$\sqrt[3]{27} = 3$	1	$\frac{1}{\sqrt{27}}$	$\frac{1}{3}$

(From Unit 3, Lesson 3.)

5. What are the solutions to the equation $(x-1)(x+2) = -2$?

$x^2 + x - 2 = -2$
$x^2 + x = 0$
$x(x+1) = 0$
$x = 0, x = -1$

$(0-1)(0+2) = -2$ ✓
$((-1)-1)((-1)+2) = -2$
$(-2)(1) = -2$ ✓

(From Unit 2, Lesson 11.)

6. Use exponent rules to explain why $(\sqrt{5})^3 = \sqrt{5^3}$.

(From Unit 3, Lesson 4.)

$\left(\sqrt{5}\right)^3 = 5^{\frac{3}{2}} = (5^3)^{\frac{1}{2}} = \sqrt{5^3}$