

Solutions

Lesson 3 Practice Problems

1. Complete the table. Use powers of 64 in the top row and radicals or rational numbers in the bottom row.

64^1	$64^{\frac{1}{2}}$	$64^{\frac{1}{3}}$	64^0	$64^{-\frac{1}{2}}$	64^{-1}
64	8	4	1	$\frac{1}{8}$	$\frac{1}{64}$

2. Suppose that a friend missed class and never learned what $25^{\frac{1}{2}}$ means.

- a. Use exponent rules your friend would already know to calculate $25^{\frac{1}{2}} \cdot 25^{\frac{1}{2}}$.

$$25^{\frac{1}{2}} \cdot 25^{\frac{1}{2}} = 25^{(\frac{1}{2} + \frac{1}{2})} = 25^1 = 25$$

- b. Explain why this means that $25^{\frac{1}{2}} = 5$.

$$5 = \sqrt{25}$$

$$(25^{\frac{1}{2}})^2 = 25 \quad \text{so} \quad 25^{\frac{1}{2}} = 5$$

3. Which expression is equivalent to $16^{\frac{1}{2}}$?

A. $\frac{1}{4}$

☒ B. 4

C. 8

D. 16.5

$$\sqrt{16} = 4$$

4. Select all the expressions equivalent to 4^{10} .

- A. $2^5 \cdot 2^2$
- ☒ B. 2^{20}
- ☒ C. $4^4 \cdot 4^6$
- D. $4^7 \cdot 4^{-3}$
- ☒ E. $\frac{4^4}{4^{-6}}$
- Handwritten work:
- $$= (2^2)^{10} = 4^{10}$$
- $$4^{(4+6)} = 4^{10}$$
- $$4^{4-(-6)} = 4^{10}$$

(From Unit 3, Lesson 1.)

5. The table shows the edge length and volume of several different cubes. Complete the table using exact values.

edge length (ft)	3	4	$\sqrt[3]{25}$	$\sqrt[3]{100}$	5	$\sqrt[3]{147}$
volume (ft ³)	27	64	85	100	125	147

(From Unit 3, Lesson 2.)

6. A square has side length $\sqrt{82}$ cm. What is the area of the square?

- A. 9.05 cm^2
- ☒ B. 82 cm^2
- C. 164 cm^2
- D. 6724 cm^2

(From Unit 3, Lesson 2.)