

Lesson 6 Practice Problems

1. Select **all** solutions to the equation $x^2 = 7$.

(A) $\sqrt{7}$

(B) $-\sqrt{7}$

C. 49

D. -49

2. Find the solution(s) to each equation, if there are any.

a. $x^2 = 9$ $x = \pm 3$

b. $\sqrt{x} = 3$ $x = 9$

c. $\sqrt{x} = -3$ No solutions

3. a. If c is a positive number, how many solutions does $x^2 = c$ have? Explain.

Two solutions
 $\pm \sqrt{c}$

- b. If c is a positive number, how many solutions does $\sqrt{x} = c$ have? Explain.

One solution
 $x = c^2$

4. Suppose that a friend missed class and never learned what $37^{\frac{1}{3}}$ means.

a. Use exponent rules your friend would already know to calculate $(37^{\frac{1}{3}})^3$.

$$(37^{\frac{1}{3}})^3 = 37^{\frac{3}{3}} = 37^1 = 37$$

b. Explain why this means that $37^{\frac{1}{3}}$ is the cube root of 37.

Since $(37^{\frac{1}{3}})^3 = 37$
take the cube root of each side of the equation
 $37^{\frac{1}{3}} = \sqrt[3]{37}$

(From Unit 3, Lesson 3.)

5. Evaluate $8^{\frac{5}{3}}$.

$$= (\sqrt[3]{8})^5 = 2^5 = 32$$

6. Write each expression without using exponents.

a. $5^{\frac{2}{3}} = \sqrt[3]{5^2} = \sqrt[3]{25}$

b. $4^{-\frac{3}{2}} = \frac{1}{(\sqrt{4})^3} = \frac{1}{2^3} = \frac{1}{8}$

(From Unit 3, Lesson 5.)

Lesson 7 Practice Problems

1. Noah solved the equation $5x^2 = 45$. Here are his steps:

$$5x^2 = 45$$

$$\begin{array}{l} x^2 = 9 \\ x = 3 \end{array}$$

Do you agree with Noah? Explain your reasoning.

No

$$x = \pm 3$$

Two solutions

2. Find the solution(s) to each equation, or explain why there is no solution.

a. $\sqrt{x+4} + 7 = 5$

$$\sqrt{x+4} = -2$$

No solutions since
 $\sqrt{\quad}$ is positive (non-negative)

b. $\sqrt{47-x} - 2 = 4$

$$\begin{array}{l} \sqrt{47-x} = 6 \\ 47-x = 36 \\ x = 11 \end{array}$$

$$\begin{array}{l} \sqrt{47-11} - 2 = 4? \\ \sqrt{16} - 2 = 4 \\ 4 - 2 = 4 \checkmark \end{array}$$

c. $\frac{1}{2}\sqrt{20+x} = 5$

$$\begin{array}{l} \sqrt{20+x} = 10 \\ 20+x = 100 \\ x = 80 \end{array}$$

$$\begin{array}{l} \frac{1}{2}\sqrt{20+80} = 5? \\ \frac{1}{2}(\sqrt{100}) = 5 \\ \frac{1}{2}(10) = 5 \checkmark \end{array}$$

3. Which is a solution to the equation $\sqrt{5-x} + 13 = 4$?

$$\sqrt{5-x} = -9$$

No solution

A. 86

B. 81

C. 9

☒ D. The equation has no solution.

4. Select **all** expressions that are equal to $\frac{1}{(\sqrt{2})^5}$.

A. $-\frac{5}{\sqrt{2}}$

☒ B. $\frac{1}{\sqrt{2^5}}$

☒ C. $\frac{1}{\sqrt{32}}$

D. $-(\sqrt{2})^5$

E. $-2^{\frac{5}{2}}$

☒ F. $2^{-\frac{5}{2}}$

(From Unit 3, Lesson 5.)

5. Which are the solutions to the equation $x^2 = 36$?

A. 6 only

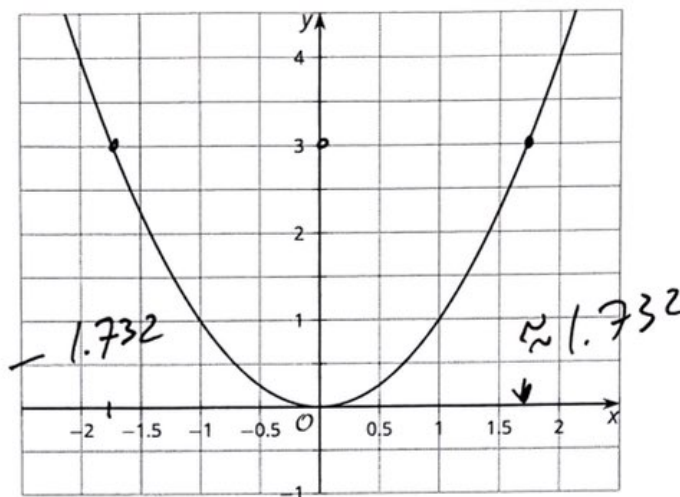
B. -6 only

☒ C. 6 and -6

D. This equation has no solutions.

(From Unit 3, Lesson 6.)

6. Here is a graph of $y = x^2$.



a. Use the graph to estimate all solutions to the equation $x^2 = 3$.

$$x \approx \pm 1.732$$

b. If you square your estimates, what number should they be close to?

3

c. Square your estimates. How close did you get to this number?

$$2.999824 \quad \text{pretty close!}$$

(From Unit 3, Lesson 6.)

7. The polynomial function $q(x) = 3x^3 + 11x^2 - 14x - 40$ has a known factor of $(3x + 5)$. Rewrite $q(x)$ as the product of linear factors.

(From Unit 2, Lesson 12.)