

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 5

ESCONDIDO ADULT SCHOOL • HiSET MATHEMATICS PREPARATION

## Square Roots & Exponents

CA HiSET Standards: NSQ.2 &amp; ALG.3 | 5 Word Problems

**Directions:** Solve each word problem. Show all work in the box provided. Write your final answer on the answer line. Include units where applicable.

**1**

A landscaper is designing a square garden with an area of 144 square feet. She needs to order fencing to go around the entire garden. Using square roots, find the length of one side of the garden. Then calculate the total amount of fencing needed to enclose it. Show your work and include units in your answer.

*Show your work:*

Answer: \_\_\_\_\_

## 2

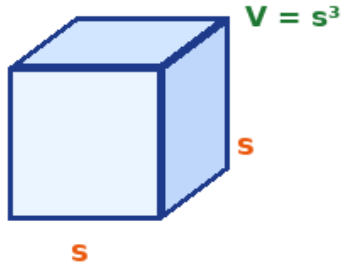
A construction worker is building a wheelchair ramp. The ramp rises 9 meters vertically and extends 12 meters horizontally. Using the Pythagorean theorem ( $a^2 + b^2 = c^2$ ), find the exact length of the ramp (the hypotenuse). First evaluate  $9^2$  and  $12^2$ , then find the square root of their sum. Round your answer to the nearest tenth if necessary.

*Show your work:*

Answer: \_\_\_\_\_

## 3

A shipping company needs to order cubic storage containers. Each container is a perfect cube with volume  $V = s^3$ , where  $s$  is the side length in meters. (a) If a container has a volume of  $512 \text{ m}^3$ , what is the side length? (b) A second container has a side length of 7 m. What is its volume? (c) Which container holds more, and by how much?

**Problem 4 — Cube Volume ( $s^3$ )**Find  $s$  when  $V = 512 \text{ m}^3$ *Show your work:*

Answer: \_\_\_\_\_

## 4

A math teacher asks students to evaluate and order five exponential expressions from least to greatest:  $2^4$ ,  $3^3$ ,  $4^2$ ,  $5^2$ , and  $2^5$ . (a) Evaluate each expression. (b) Order all five values from least to greatest. (c) Which two expressions have the same value? (d) How much greater is  $2^5$  than  $3^3$ ?

*Show your work:*

Answer: \_\_\_\_\_

## ANSWER KEY — Instructor Copy

|          |                                                                                                                                                                                                                                    |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b> | $s = \sqrt{144} = 12 \text{ ft}$<br>Perimeter = $4 \times 12 = 48 \text{ ft}$ of fencing needed.                                                                                                                                   |
| <b>2</b> | $a^2 + b^2 = c^2$<br>$9^2 + 12^2 = c^2$<br>$81 + 144 = c^2$<br>$225 = c^2$<br>$c = \sqrt{225} = 15 \text{ meters}$                                                                                                                 |
| <b>3</b> | (a) $s^3 = 512 \rightarrow s = \sqrt[3]{512} = 8 \text{ m}$<br>(b) $V = 7^3 = 343 \text{ m}^3$<br>(c) The first container ( $512 \text{ m}^3$ ) holds more by $512 - 343 = 169 \text{ m}^3$                                        |
| <b>4</b> | (a) $2^4 = 16$ , $3^3 = 27$ , $4^2 = 16$ , $5^2 = 25$ , $2^5 = 32$<br>(b) Least to greatest: 16, 16, 25, 27, 32<br>( $2^4$ , $4^2$ , $5^2$ , $3^3$ , $2^5$ )<br>(c) $2^4$ and $4^2$ both equal 16<br>(d) $2^5 - 3^3 = 32 - 27 = 5$ |