

### Objective 23-24

Evaluate square and cube roots

Vocab:

**Square root:** number that is multiplied by itself to equal a given number.

Ex: If  $a \cdot a = b$  then  $\sqrt{b} = a$

**Cube root:** number that is multiplied by itself three times to equal a given number.

Ex: If  $a \cdot a \cdot a = b$  then  $\sqrt[3]{b} = a$

Example 1: Solve  $\sqrt{\frac{1}{36}} =$

Step 1: square root the numerator and denominator.

$$\frac{\sqrt{1}}{\sqrt{36}} =$$

Step 2: Determine the value of the numerator

$$\sqrt{1} = \pm 1$$

Step 3: Determine the value of the denominator and simplify.

$$\sqrt{36} = 6 \quad \leftarrow \quad \boxed{\text{Answer is } \pm \frac{1}{6}}$$

Example 2: Solve  $\sqrt[3]{\frac{1}{64}}$

Step 1:

$$\frac{\sqrt[3]{1}}{\sqrt[3]{64}} =$$

Step 2:  $\sqrt[3]{1} = \pm 1$

$$\text{Step 3: } \sqrt[3]{64} = \pm 4 \quad \leftarrow \quad \boxed{\text{Answer is } \pm \frac{1}{4}}$$

**Practice:** Solve the following square and cube root problems. *Show your work!*

- |                                |                              |
|--------------------------------|------------------------------|
| 1. $\sqrt{9} =$                | 5. $\sqrt{\frac{1}{100}} =$  |
| 2. $\sqrt{\frac{1}{121}} =$    | 6. $\sqrt[3]{512} =$         |
| 3. $\sqrt[3]{216} =$           | 7. $\sqrt[3]{\frac{1}{8}} =$ |
| 4. $\sqrt[3]{\frac{1}{343}} =$ | 8. $\sqrt{144} =$            |

**Additional Help:**

<http://www.purplemath.com/modules/solvquad2.htm>

Guided Practice:

$$\sqrt{64} =$$

$$\sqrt{\frac{1}{25}} =$$

$$\sqrt[3]{\frac{1}{27}} =$$

SQUARES, CUBES, AND SQUARE ROOTS (1-20)

| NUMBER | SQUARE | CUBE | SQUARE ROOT OF NUMBER |
|--------|--------|------|-----------------------|
| 1      | 1      | 1    | 1.000                 |
| 2      | 4      | 8    | 1.414                 |
| 3      | 9      | 27   | 1.732                 |
| 4      | 16     | 64   | 2.000                 |
| 5      | 25     | 125  | 2.236                 |
| 6      | 36     | 216  | 2.449                 |
| 7      | 49     | 343  | 2.645                 |
| 8      | 64     | 512  | 2.828                 |
| 9      | 81     | 729  | 3.000                 |
| 10     | 100    | 1000 | 3.162                 |
| 11     | 121    | 1331 | 3.316                 |
| 12     | 144    | 1728 | 3.464                 |
| 13     | 169    | 2197 | 3.605                 |
| 14     | 196    | 2744 | 3.741                 |
| 15     | 225    | 3375 | 3.872                 |
| 16     | 256    | 4096 | 4.000                 |
| 17     | 289    | 4913 | 4.123                 |
| 18     | 324    | 5832 | 4.242                 |
| 19     | 361    | 6859 | 4.358                 |
| 20     | 400    | 8000 | 4.472                 |