



**Unit 1**

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

**Lesson 1.3**

**Grade 7A**

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

**Square roots and cube roots**

**Worksheet (1)**

**Objectives:**

- Find the squares of positive and negative integers and their corresponding square roots.
- Find the cubes of positive and negative integers and their corresponding cube roots.
- Learn to recognize natural numbers, integers and rational numbers.

**Squares**

Multiplying a number by itself is called squaring.

<b>Number</b>	<b>Square</b>
1	1
2	4
3	9
4	16
5	25

**Both positive and negative numbers squared give a positive result.**

- Example:  $(-3)^2 = -3 \times -3 = 9$   
 $(3)^2 = 3 \times 3 = 9$

## Square Roots

- Square root is the opposite of squaring.
- Example:  $\sqrt{9} = 3$  or  $-3$  because  $3^2 = 9$  and  $(-3)^2 = 9$

## Cubes

Multiplying the number by itself three times is called **Cubing**.

Example:  $2 \times 2 \times 2 = 8$ .

Number	Cube
1	1
2	8
3	27
4	64
5	125

**Negative numbers cubed keep their negative sign.**

- Example:  $(-2)^3 = -8$

## Cube Roots

Cube root is the number which gives the original number when cubed.

Examples:  $\sqrt[3]{27} = 3$  and  $\sqrt[3]{-8} = -2$ .

- Find the square of -8 \_\_\_\_\_
- Find  $\sqrt{81}$  \_\_\_\_\_
- Find the cube of -4. \_\_\_\_\_

## Natural Numbers

- **Definition:** counting numbers and zero.
- **Always positive.**
- **Examples:** 0, 1, 2, 3, 4, 5 ...
- **Tip to recognize:** Ask yourself, “Can I count objects with this number starting from 1?”
  - ✓ 3 → Yes, you can count 3 apples.
  - ✗ -2 → No, negative numbers are not natural numbers

## Integers

- **Definition:** All whole numbers plus **negative numbers**.
- **Examples:** ..., -3, -2, -1, 0, 1, 2, 3 ...
- **Tip to recognize:** Ask: “Is this a whole number, or its negative?”
  - ✓ -5 → Integer
  - ✓ 0 → Integer
  - ✓ 7 → Integer
  - ✗  $1/2$  → Not an integer

## Rational Numbers

- **Definition:** Numbers that can be written as a **fraction**, where **p** and **q** are integers and  $q \neq 0$ .
- **Examples:**  $1/2$ ,  $-3/4$ , 5 ( $5 = 5/1$ ), 0.25 ( $0.25 = 1/4$ )
- **Integers and fractions are included in the set of rational numbers.**
- **Tip to recognize:** Ask: “Can I write it as a fraction?”
  - ✓  $2 \rightarrow 2/1 \rightarrow$  Rational
  - ✓  $-3/5 \rightarrow$  Rational

Not all decimal numbers are rational, but **some are**, depending on the type of decimal.

## Types of decimal numbers

### 1. Terminating decimals

- Example:  $0.5(1/2)$ ,  $2.75(11/4)$ ,  $0.125(1/8)$ ,  $0.75(3/4)$
- These **can always be written as fractions**

✓ So all terminating decimals are **rational**.

### 2. Repeating decimals

- Example:  $0.3333(1/3)...$ ,  $1.272727(14/11)...$
- These **can also be written as fractions**

✓ All repeating decimals are **rational**.

## ✓ Conclusion

- **All terminating and repeating decimals are rational.**
- **Decimals that are non-terminating and non-repeating are irrational.**
- A **terminating decimal** is any decimal that has a finite number of digits after the decimal point.

**Identify the type of number:**

Classify each number as **Natural (N)**, **Integer (Z)**, or **Rational (Q)**:

- a) 7
- b) -12
- c)  $\frac{3}{4}$
- d) 0.25
- e) 15

**Fill in the blanks:**

- a) A number greater than 0 and without a fractional part is called a \_\_\_\_\_.
- b) Numbers that can be written in the form  $\frac{p}{q}$ , where p and q are integers are called \_\_\_\_\_.
- c) Numbers like -3, 0, 5 are \_\_\_\_\_.

**Convert into rational form:**

Write the following numbers as fractions:

- a) 0.6
- b) 2.75
- c) -5