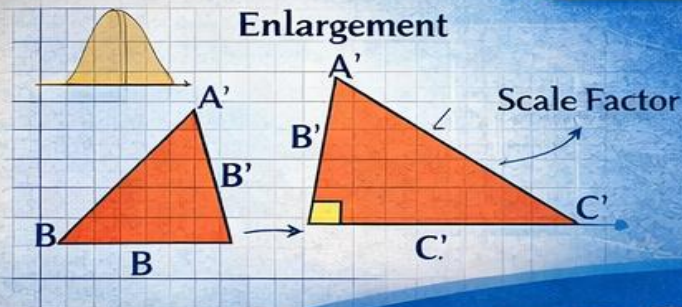
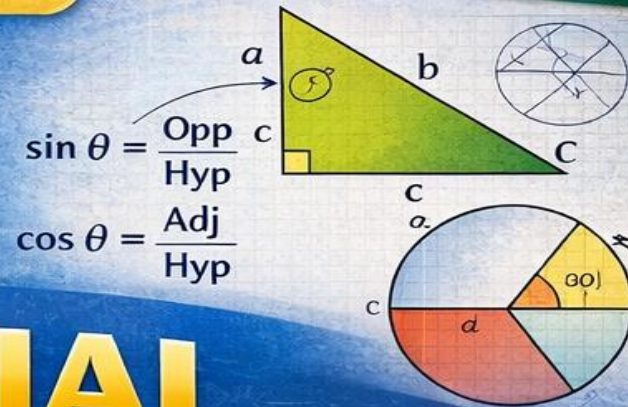




Competence Based Education SENIOR SCHOOL CURRICULUM

GRADE 10



ESSENTIAL MATHEMATICS



Probability

$$P(A) = \frac{\text{Number of Favorable Outcomes}}{\text{Total Outcomes}}$$



Dice: 1 2 3 4 5 6

$$P(\text{rolling a 4}) = \frac{1}{6}$$



Probability

$$P(A) = \frac{\text{Number of Favorable Outcomes}}{\text{Total Outcomes}}$$



Dice: 1 2 3 4 5 6

$$P(\text{rolling a 4}) = \frac{1}{6}$$



1. NUMBERS AND ALGEBRA

1.1. REAL NUMBERS

1.2. Introduction to real numbers

- Real numbers are classified into whole numbers, integers, rational numbers and irrational numbers.
- **Even numbers** are whole numbers that are divisible by two. The digit in the ones place of an even number can be 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, etc.
- **Odd numbers** are whole numbers that are not divisible by two. The digit in the ones place of an odd number can be 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, etc.
- **Prime numbers** are whole numbers that have exactly two factors; 1 and the number itself. Examples of prime numbers between 0 and 100 are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97.
- **Composite numbers** are whole numbers that have more than two factors. For example:
 - o 28, whose factors are 1, 2, 4, 7, 14 and 28
 - o 100, whose factors are 1, 2, 4, 5, 10, 20, 25, 50 and 100
- Note that; the factors of a composite number may be even, odd or prime numbers.

1.3. Classifying real numbers as rational or irrational

- Numbers that can be expressed as a fraction in the form $\frac{a}{b}$ where **a** and **b** are integers and **b** $\neq$ 0, are called **rational numbers**.
- Rational numbers include:
 - Whole numbers such as 1, 2, 3, 4 and 5
 - Integers such as -7 and -3
 - Fractions such as $\frac{3}{5}$ and $\frac{7}{8}$
 - Terminating decimals such as 0.25 and 0.75
 - Non-terminating decimals with a repeating pattern such as 0.666... and 0.333...
 - Squares, square roots, cubes and cube roots of numbers that result in a terminating decimal, a fraction, a whole number or a non-terminating decimal with a repeating pattern. Examples: $\sqrt{9}$
- Numbers that **cannot** be expressed as a fraction in the form $\frac{a}{b}$ where **b** $\neq$ 0, are called **irrational numbers**.
- Irrational numbers are non-terminating decimals with no repeating pattern, and therefore cannot be written as fractions.
- Common examples of irrational numbers include:
 - Square roots of numbers that are not perfect squares, such as $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$, $\sqrt{7}$
 - Mathematical constants such as π
- Examples of irrational numbers include: $\sqrt{5}$, $\sqrt{23}$, $\sqrt{29}$, and $\frac{3}{101}$.
- When written as decimals, these numbers are approximately:
 - $\sqrt{5} = 2.236067977 \dots$
 - $\sqrt{23} = 4.795831523 \dots$