PANCHSHEEL PUBLIC SCHOOL

SESSION 2024-25

ENTRANCE EXAMINATION

CLASS – 8

SYLLABUS

STUDY MATERIAL

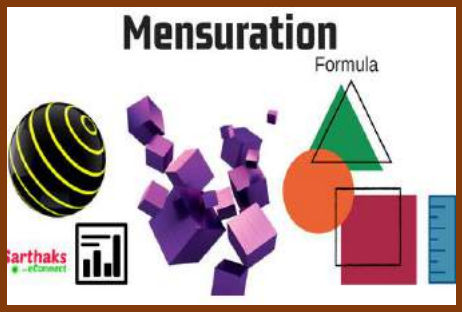
SAMPLE PAPER

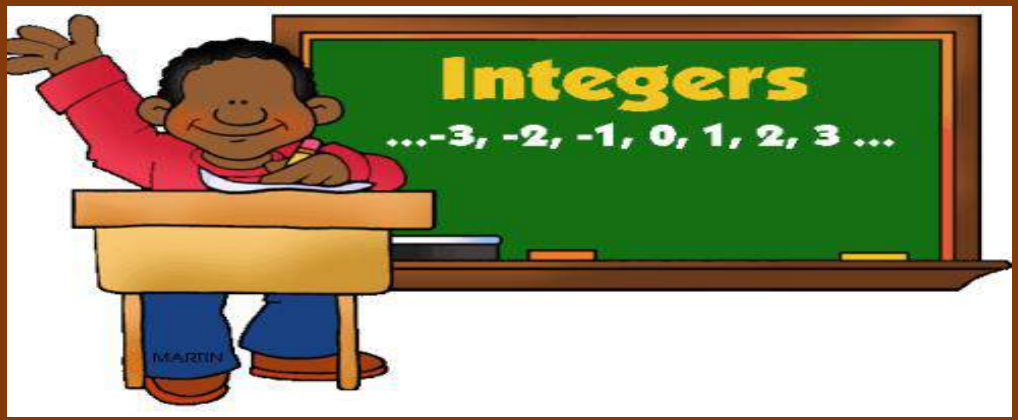
MATHEMATICS

SYLLABUS

CLASS – 8

1) DIMENSIONS EXPLORED (MENSURATION)
2) EQUATIONS UNVEILED (ALGEBRA)
3) NUMBER WITHOUT FRACTIONS (INTEGERS)





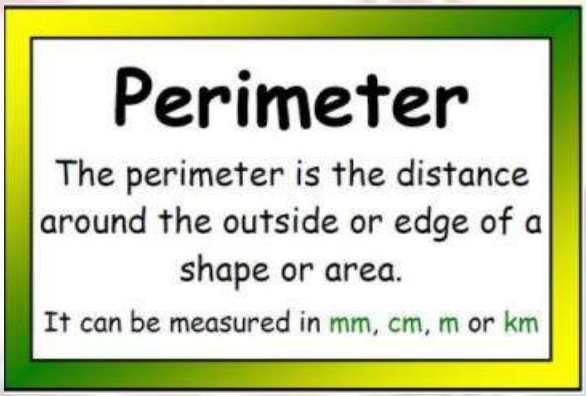
PANCHSHEEL PUBLIC SCHOOL
10+2 Senior Secondary School (Affiliated & Recognized by CBSE)
Jaitpur, Badarpur, New Delhi-44
SESSION – 2024-25
ENTRANCE EXAM
STUDY MATERIAL AND SAMPLE PAPER

CHAPTER -1
DIMENSIONS EXPLORED(MENSURATION)

PERIMETER

In a closed figure, we start from any point and reach at the same point by moving along the side and make one complete round . The distance thus covered is called the perimeter of the figure.

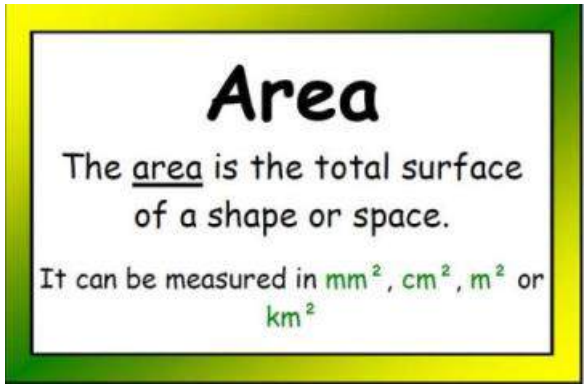
So, Perimeter of a closed figure = The sum of the length of the closed figure



AREA

In everyday life, we come across regions enclosed by the figures of various shapes such as triangular region, circular region, rectangular region etc. Here, by region, we mean the part of a plane enclosed by a simple figure together with its interior.

The measurement of the magnitude of surface occupied by a figure is known as its area.



Basic formulae of 2-D and 3-D shapes

Examples of 2-D shapes are square, rectangle, circle, triangle etc. and 3-D shapes are cube, cuboid, cylinder, cone etc.

Mensuration Formulas

Perimeter	
Square	$P = 4s$
Rectangle	$P = 2(l + w)$

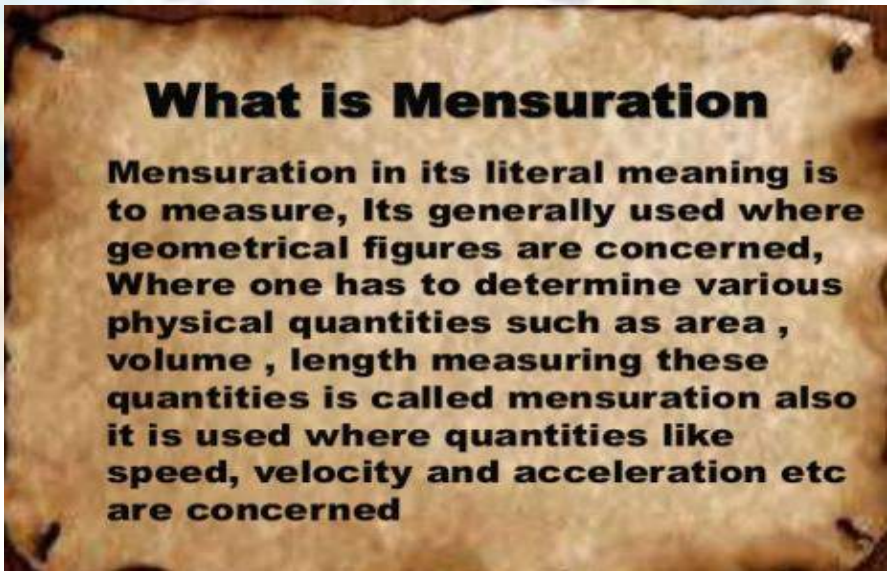
Circumference	
Circle	$C = 2\pi r$

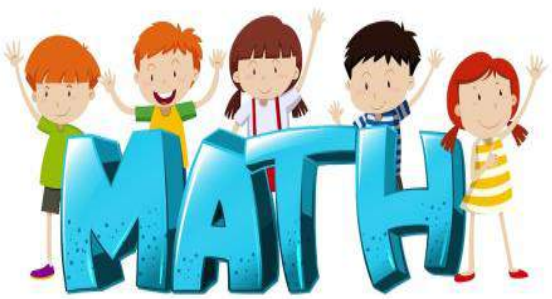
Area	
Square	$A = s^2$
Rectangle	$A = lw$
Triangle	$A = \frac{1}{2}bh$
Trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$
Circle	$A = \pi r^2$

Surface Area	
Cube	$SA = 6s^2$
Cylinder	$SA = 2\pi rh + 2\pi r^2$
Cone	$SA = \pi rl$
Sphere	$SA = 4\pi r^2$

Volume	
Cube	$V = s^3$
Cylinder	$V = \pi r^2 h$
Cone	$V = \frac{1}{3}\pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$

DO YOU KNOW ?

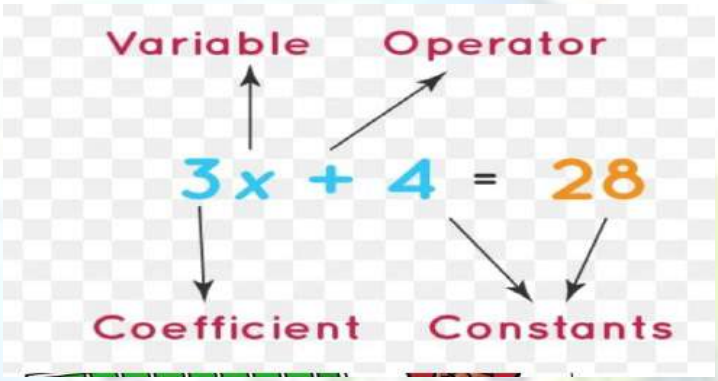


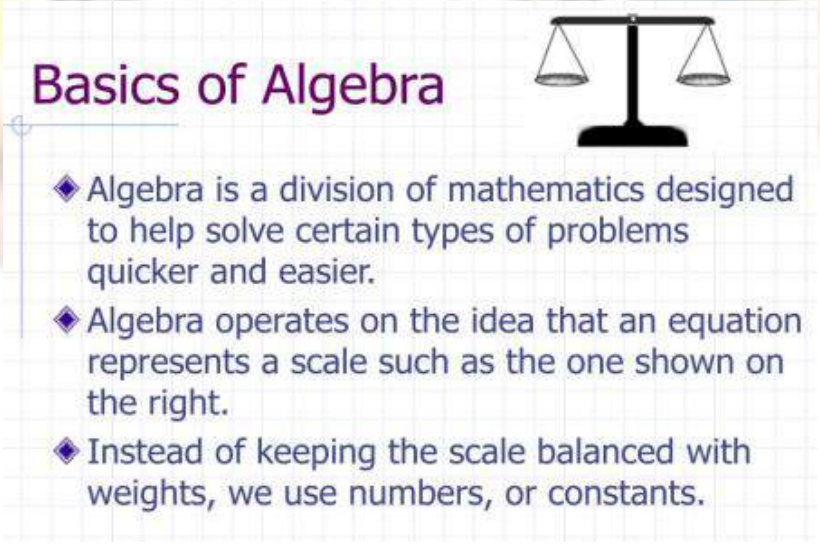


CHAPTER – 2
EQUATIONS UNVEILED(ALGEBRA)

Algebra is the concept based on unknown values called variables. The important concept of algebra is equations. It follows various rules to perform arithmetic operations. The rules are used to make sense of sets of data that envolve two or more variables.

The four basic operations in algebra are addition, subtraction, multiplication and division. Different operators (+, -, x, /) are used to separate different terms to perform these operations among the operands.





For generating an algebraic expression, we use the concepts of literal numbers.

LITERAL NUMBERS

The letters which are used to represent or replace numbers are known as literal numbers or simply literals.

CONSTANTS

A symbol with fixed numerical value is called a constant.

Continuing with *Algebraic expressions* we can classify them based on *number* of algebraic terms present in them

An *algebraic expression* with single *algebraic term is*

Monomial Expressions

Eg: 3x, 5c, 8b

An *algebraic expression* with two *algebraic term is*

Binomial Expressions

Eg: 4x+4y, 3y − 4a, 9a + 10z

With three *algebraic terms an algebraic expression is called as*

Trinomial Expressions

Eg: 34x + 4b + 9c, 8x − 32a + 4y

LINEAR EQUATIONS

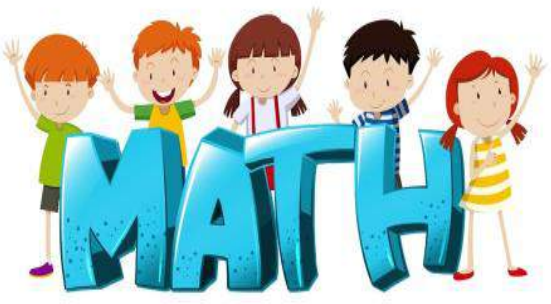
An equations having the highest power of the variables involved as 1 is called a linear equations.

For examples : The equations $3x - 7 = 12$, $4x = 50$,$12 - 4x = 25$ etc.

- A value of the variable which when substituted for the variable in an equation makes LHS = RHS is said to satisfy the equation and is called a solution or a root of the equation.

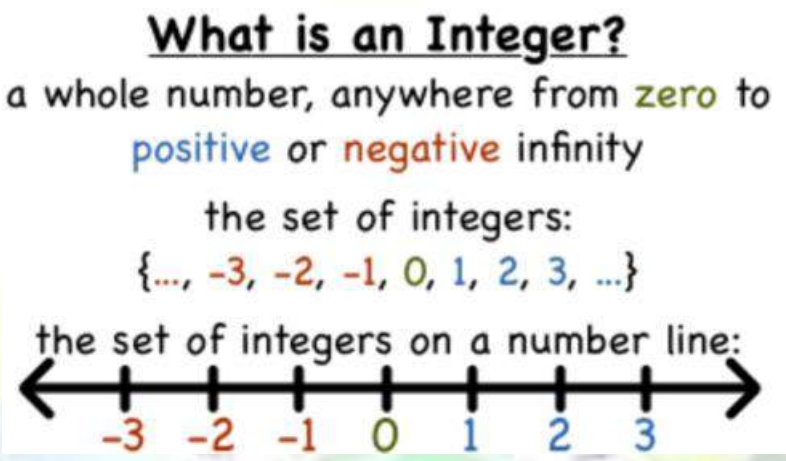
DO YOU KNOW ?

- ALGEBRA IS IMPLIMENTED IN VARIOUS STUDIES SUCH AS ENGINEERING, ECONOMICS, SCIENCES, MATHEMATICS AND MEDICINE.

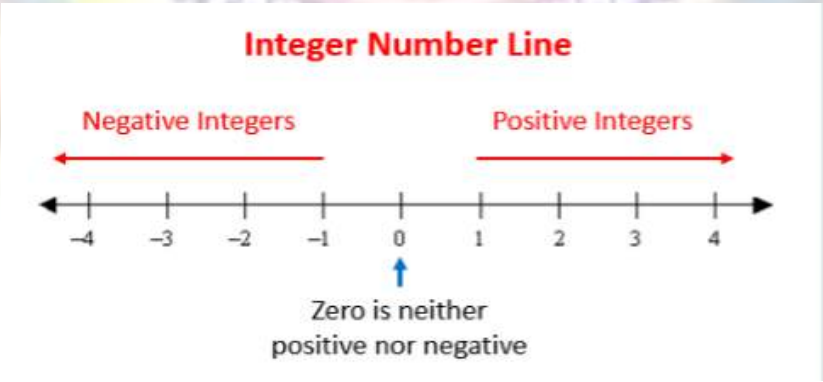


CHAPTER – 3
NUMBERS WITHOUT FRACTIONS(INTEGERS)

The group of whole numbers with negative numbers is called integers i.e. 0, 1, 2, 3, ……., -1, -2, -3, …….. are integers.
Integers are generally used to signify two contradicting situations. These are not just any numbers, they are numbers with signs. Positive numbers and negative numbers can have varying applications. The most real application of integers is measuring the temp.



Integers are marked on a number line as follows: The integer 0 is marked at the centre of the number line. All the positive integers are marked towards the right of zero and all the negative integers are plotted towards the left of 0 on the number line.



USES OF INTEGERS IN REAL LIFE

Integers are commonly used in describing temperature above/below freezing point, debit/credit of money, a geographical level above/below sea level, elevator level when it is above/below the ground level, as a bonus and penalty in quizzes/games, etc.

BASIC PROPERTIES OF INTEGERS

Basic properties of integers are :

- All the whole numbers are integers but all the integers are not whole numbers.
- CLOSURE PROERTY
- COMMUTATIVE PROPERTY
- ASSOCIATIVE PROPERTY
- DISTRIBUTIVE PROPERTY

Property	Operations on Integers			
Name	Addition	Subtraction	Multiplication	Division*
Closure	$a + b \in Z$	$a - b \in Z$	$a \times b \in Z$	$a \div b \notin Z$
Commutative	$a + b = b + a$	$a - b \neq b - a$	$a \times b = b \times a$	$a \div b \neq b \div a$
Associative	$(a + b) + c = a + (b + c)$	$(a - b) - c \neq a - (b - c)$	$(a \times b) \times c = a \times (b \times c)$	$(a \div b) \div c \neq a \div (b \div c)$
Distributive	$a \times (b + c) = ab + ac$	$a \times (b - c) = ab - ac$	Not applicable	Not applicable

where $a, b, c \in Z$ *b is a non-zero integer

The four operations of integers are addition, subtraction, multiplication and division.

RULES REGARDING ADDITION OF INTEGERS

When two integers are added, then the following rules have to be applied:

Adding Positive and Negative Integers			
Integer Sign	Operation	Answer Sign	Example
+ + +	Add	+	2 + 5 = 7
- + -	Add	-	- 2 + (- 5) = - 2 - 5 = - 7
+ + -	Subtract	Larger Integer's Sign	2 + (- 5) = 2 - 5 = - 3
- + +	Subtract	Larger Integer's Sign	- 2 + 5 = 3

RULES REGARDING SUBTRACTION OF INTEGERS

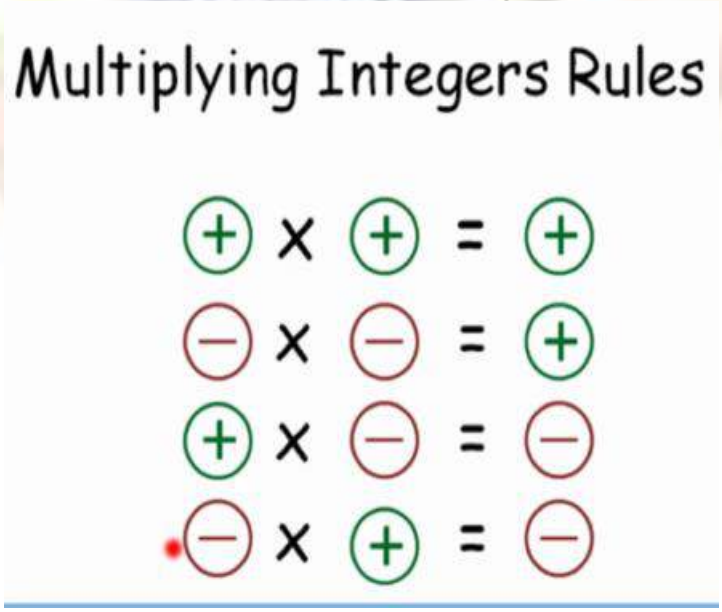
When two integer's p and q are subtracted, then for subtracting q from p the sign of q is changed and after that it is added it to p.

For calculation, and for carrying out subtraction:

Subtracting Positive and Negative Integers			
Integer Sign	Operation	Answer Sign	Example
+ - +	Subtract	Larger Integer's Sign	2 - 5 = - 3
- - -	Subtract	Larger Integer's Sign	- 2 - (- 5) = - 2 + 5 = 3
+ - -	Add	+	2 - (- 5) = 2 + 5 = 7
- - +	Add	-	- 2 - 5 = - 7

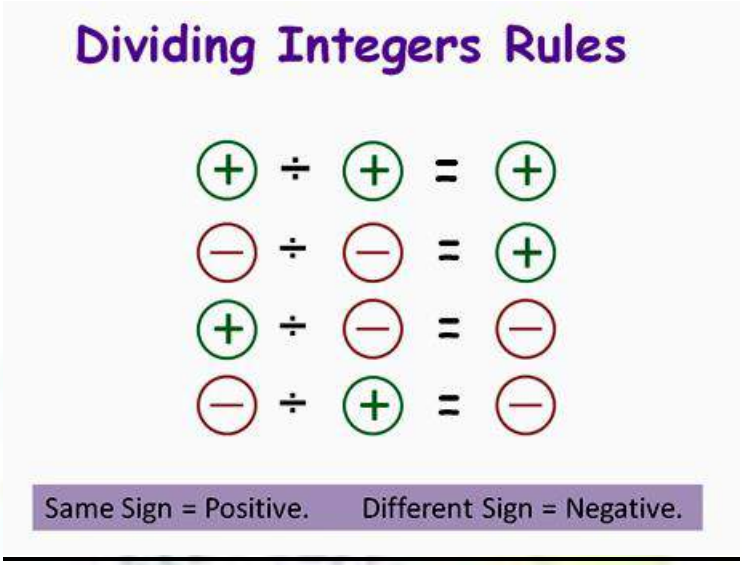
RULES REGARDING MULTIPLICATION OF INTEGERS

When two integers multiplied, if both (multiplier and multiplicand) have same sign, the answer will be positive and when both have different sign, the answer will be negative.



RULES REGARDING DIVISION OF INTEGERS

When two integers divided, if both (Dividend and Divisor) have same sign, the answer will be positive and when both have different sign, the answer will be negative



DO YOU KNOW ?

❖ The integer was introduced in the year 1563 by Arbermouth Holst