NUMBERS

N (NATURAL NUMBERS) = Normal counting numbers 1,2,3,…
W (WHOLE NUMBERS) = **N** + Zero
I (INTEGERS) = **W** + Negative Numbers
Q (RATIONAL NUMBERS) = **I** + Fractions
R (REAL NUMBERS) = **Q** + Irrational Numbers
C (COMPLEX NUMBERS) = **R** + Imaginary Numbers

To check if a number **N** is prime,one can check if **N** is divisible by any prime less than or equal to $\sqrt{N}$.

The order of priority for basic mathematical operations is **VBODMAS**,where:

V(Vinculum or Bar) }
B(Bracket) } These need to be solved before anything else
O(Of) - Indicates a multiplication of higher priority
D(Division) } If only multiplication and division remain,we go from left to right
M(Multiplication) }
A(Addition) } If only addition and subtraction remain, we go from left to right
S(Subtraction) }

(A good mnemonic to remember this order is"**V**ery **B**ored **O**f **D**oing **M**athematics **A**t **S**chool")

In terms of a number line,we can define the following functions for a real number x

$[x]$: Greatest integer less than or equal to **x** = the first number to the left of x on the number line.Also known as rounded-down value.

L(x): Least integer greater than or equal to x = the first number to the right of x on the number line.Also known as rounded-up value.

|x|: Absolute value of x = the distance from 0 to x on the number line.Also, known as modulus.

Note that:

$[x] \leq x \leq L(x)$ (equal only if x is an integer)

$|x| \leq x$ (equal only when x is a non-negative)

PROBLEMS:

1.State True / False / Cannot be determined

a)Even +Odd+odd=Even **b)**Even *Odd*Even*Odd=Even **c)**(Even+Odd)*(Even+Odd)=Even

d)Positive+Positive+Negative=Positive **e)**Positive*Positive*Negative*Negative=Positive

f)(Positive*Positive)+(Negative*Negative)-Negative=Positive

g)All fractions can be written as mixed fractions

h)All recurring numbers can be written in a rational format.

2.Insert >,= or< signs in between the following pairs of fractions:

a)11/14 ☐ 13/16 b)11/8 ☐ 13/10 c)14/19 ☐ 7/9 d)3/14 ☐ 5/23

e)217/229 ☐ 219/231 f)271/263 ☐ 461/473

3.Show that for any number N,it is true that N× $N!$=(N+1)! $- N!$

4.Match the following expressions with their appropriate values:

S.No.	Expression	Option	Value
1.	$\sqrt{80.88} + 7 \div \overline{4.1 - (-0.9)} - (2.99)^2$	a	1.0
2.	$117 \div (31 + 4 \times 2) \div 2$	b	3.0
3.	$0.25 \times \overline{1.99 + 1.99} + 16.39 \div 8.19$	c	1.4
4.	$7.17 - \overline{\sqrt{35.78} + 1} + 0.8$	d	1.8
5.	$(2.1699 + 3.8298) \times (0.465 - 0.161)$	e	1.5

5.Let n! = 1 × 2 × 3 × 4 ×. . . × n for integer n ≥ 1. What could be the value of 1! + (2× 2!) + (3 ×3!) + (4× 4!) +. . . (10 ×10!)?

a)11 × 11! **b)** 11! **c)** 11! -1 **d)** 11! + 1

6. The number of people writing a test is a prime number less than 200. The ratio of the people pass to those who fail,could be:

a) 82 : 83 **b)**75 : 78 **c)**76 : 81 **d)**91 : 78

7. The post office has stamps of Rs. 1, Rs. 3 and Rs. 7.Which of the following totals cannot be achieved by buying exactly 100 stamps?

a) Rs. 298 **b)** Rs.600 **c)** Rs. 473 **d)** Rs. 440

8. Let p,q and r be distinct integers, that are odd and positive. Which of the following must be true?

a) (p+q) (q+r) (r+p) is negative **b)** (p+q) (q+r) (r+p) is even

c) (q - p) (q – r) (p –r) is positive **d)** (p+q) (q+r) (r+p) is odd

9. Which of the following statements is true?

a) [x] – L(x) = -1 **b)** [x] + |x| ≥ 0 **c)** |x+y| > |x-y| **d)** L(x) + |x| ≥ 0

10) The product of 10 integers is 1. Can their sum is equal to 0?

11) Can you find 5 odd numbers which add up to 100?

12) Find out all the Prime numbers between 1 and 100 and memorise them.