

**Important**  
**Maths Formulae**  
**for 5<sup>th</sup> to 10<sup>th</sup> Std Students**  
**E Book PRO**

---

**CONTENTS**

---

1. ARITHMETIC RULES FOR ADDITION AND SUBTRACTION
2. INDISDE NUMBERING SYSTEM
3. INDIAN SYSTEM : PLACE VALUE CHART
4. DIVISIBILTY TRICKS
5. TIME MEASUREMENT
6. UNDERSTANDING GREEK SYMBOLS
7. IMPORTANT SYMBOLS IN MATHEMATICS
8. SQUARE AND CUBE ROOTS
9. ROMAN NUMBERS
10. EXPONENTS AND RULES

### 1. Arithmetic Rules for Addition or Subtraction

If you are having two numbers and subtracting them

1. You have to subtract from bigger number to smaller number 1<sup>st</sup>. After subtracting from it put a sign of bigger number (whether it may negative or positive)

e.g.  $20 - 10 = 10$  Here 1<sup>st</sup> number is big compared to 2<sup>nd</sup> number. So, We subtract it from 1<sup>st</sup> number to 2<sup>nd</sup> number i.e. 10 here bigger number is 20 its sign is positive so, we are not put any sign here because default it is positive number.

e.g.  $20 + 10 = -10$  Here 1<sup>st</sup> number is big compared to 2<sup>nd</sup> number. So, We subtract it from 1<sup>st</sup> number to 2<sup>nd</sup> number i.e. 10 here bigger number is 20 its sign is negative so, we have to put negative sign here. Here giving sign is important.

### Arithmetic Rules for Multiplication Relationship between two numbers

+	x	+	=	+
+	x	-	=	-
-	x	-	=	+
-	x	+	=	-

---

## 2. Inside Number System :

---

**Natural numbers** :  $N = \{1, 2, 3, 4, 5, \dots\}$

**Whole numbers** :  $W = \{0, 1, 2, 3, 4, 5, \dots\}$

**Integers** :  $Z = \{\dots, -3, -2, -1, 0, +1, +2, +3, \dots\}$   
A set containing positive and negative numbers is called as Integers.

**Positive integers** :  $Z = \{+1, +2, +3\}$   
A set containing positive numbers is called as Positive Integers.

**Negative integers** :  $Z = \{-1, -2, -3\}$   
A set containing Negative numbers is called as Negative Integers.

**Prime Numbers** : A Prime number is one which is divisible by 1 and itself and not by any other number.

E.g. 2, 3, 5, 7, 11, 13, 17, 19, 23, 31, 37, 41

**Composite Numbers** : All other numbers which are not prime numbers are called composite numbers.

E.g. : 4, 8, 10, 15, 24, 58 .. etc

**Note** : 1 is neither prime number nor a composite number

**Odd Numbers** : The number which are not completely divisible by 2 are called Odd Numbers.

E.g. 1, 3, 5, 7, 9 ....

**Even Numbers** : The number which are completely divisible by 2 are called Even Numbers.

E.g. 2, 4, 6, 8, 10 ....

**Rational Numbers** :  $Q = P$  Numbers in the form  $p/q$  are called Rational Numbers.  
Where  $p$  and  $q$  are integers  $q \neq 0$

**Irrational Numbers** :  $\text{Ir} = \{ + \sqrt{2}, \sqrt{3}, \}$

**Real Numbers** :  $\text{R} = \{ \text{A set of all rational numbers \{Its sub sets\} and irrational numbers are called Real Numbers.} \}$

**Properties of Real Numbers :**

If a, b a and c are integers

1. Commutative property of addition

$$a + b = b + a$$

2. Commutative Property of Multiplication

$$a * b = b * a$$

3. Associative property of addition

$$(a + b) + c = a + (b + c)$$

4. Associative Property of Multiplication

$$(a * b) * c = a * (b * c)$$

5 Distributive property of addition

$$a \times (b + c) = ab + ac$$

6. Additive Identity **0** is additive identity

$$a + 0 = a$$

7. Multiplicative Identity **1** is additive identity

$$a \times 1 = a$$

8. Additive Inverse -a is additive identity

$$\text{'a' additive inverse is } = -a$$

9. Multiplicative Inverse of a is  $\frac{1}{a}$

$$a \text{ is multiplicative inverse is } \frac{1}{a}$$

---

### 3. Indian System : Place Value Chart

---

#### Indian System : Place Value Chart

Crores		Lakhs		Thousand		One		
10,00,00,000	1,00,00,000	10,00,000	1,00,000	10,000	1,000	100	10	1
Ten Crore	One Crore	Ten Lakh	One Lakh	Ten thousand	One thousand	One hundred	Ten	One

#### International System for Place Value Chart :

10 Lakh	==	1 Million
1 Crore	==	100 Lakhs = 10 Millions
10 Crores	==	100 Millions
100 Crores	==	1000 Millions = 1 Billion
1000 Crores	==	10,000 Millions = 10 Billion

Millions			Thousand			Ones		
100,000,000	10,000,000	10,00,00,00	100,000	10,000	1,000	100	10	1
Hundred Million	Ten Million	One Million	Hundred Thousand	Ten thousand	One thousand	One hundred	Ten	One

---

**4. Divisibility Trick :**

---

1. A Natural number is divisible by 2 if the last digit is either 0, 2, 4, 6, 8.  
For e.g. 34, 38, 26, 56....etc
  2. A Natural number is divisible by 2 If the number obtained by adding all digits is divisible by 3.  
For e.g. 33 – if we add  $3+3 = 6$  . 6 is divisible by 3 So, it is divisible by 3
  3. A Natural number is divisible by 4 If the number obtained by adding last 2 digits digits is divisible 4.  
For e.g. 144 – if we add  $4+4 = 8$  . 8 is divisible by 4 So, it is divisible by 4
  4. A Natural number is divisible by 5 If the given numbers last number is either 5 or 0. Then it is divisible by 5.  
For e.g. 150 – Here last number is 0 So it is divisible by 5.
  5. If A Natural number is divisible by 2 and 3 then that number is divisible by 6.  
For e.g. 140 – It is divisible by 2 and 3 So, it is divisible by 6
  6. A Natural number is said to be divisible by 8 If their last 3 digit number is divisible by 8.  
For e.g. 1024 – It is divisible by 8
  7. If A Natural number is divisible by 9 if that all digit numbers total is divisible by 9. then that number is divisible by 9.  
For e.g. 99 –  $9+9 = 18$  It is divisible by 9 So, it is divisible by 9
  8. If A Natural number is divisible by 10 if its last digit is 0 then that number is divisible by 10.  
For e.g. 80 – Its last number is 0 So, it is divisible by 10
-

---

**5. Time Measurements :**

---

Year : The time taken by the earth to rotate around the sun is about 365.24 days is called One Year.

Month : The approximate time taken by the moon to rotate around the earth.  
The 12 months of the year days vary from 28 (29 days in leap year) to 31 days.

Week : 7 days together make 1 week.

Day : The time taken by the earth to complete one rotation on the axis is called one day i.e. 24 hours.

Hour : 24 hours make one day. The day is divided into hours AM (Anti meridian ) and PM (Post meridian).

**Table of Time :**

60 seconds	make	1 Minute (min)
60 minutes	make	1 Hour (h)
24 Hours	make	1 Day
30 Days	make	1 Month
365 Days	make	1 year = 12 months
366 Days	make	1 Leap year = 12 months
10 years	make	1 Decade
100 years	make	1 Century
1000 years	make	10 Centuries = 1 Millennium

Every Year has 365 Days

365 Days = 54 Weeks = 12 Months

After every three years the next coming fourth year is called Leap Year. The leap year we can calculate or find by dividing it by 4. For E.g. 1992 , 2004 . etc.

In Leap year February month has 29 days.



**Jubilee Celebrations :**

An Anniversary is completion of 1 year

A Decade is completion of 10 years

A Silver Jubilee is completion of 25 years

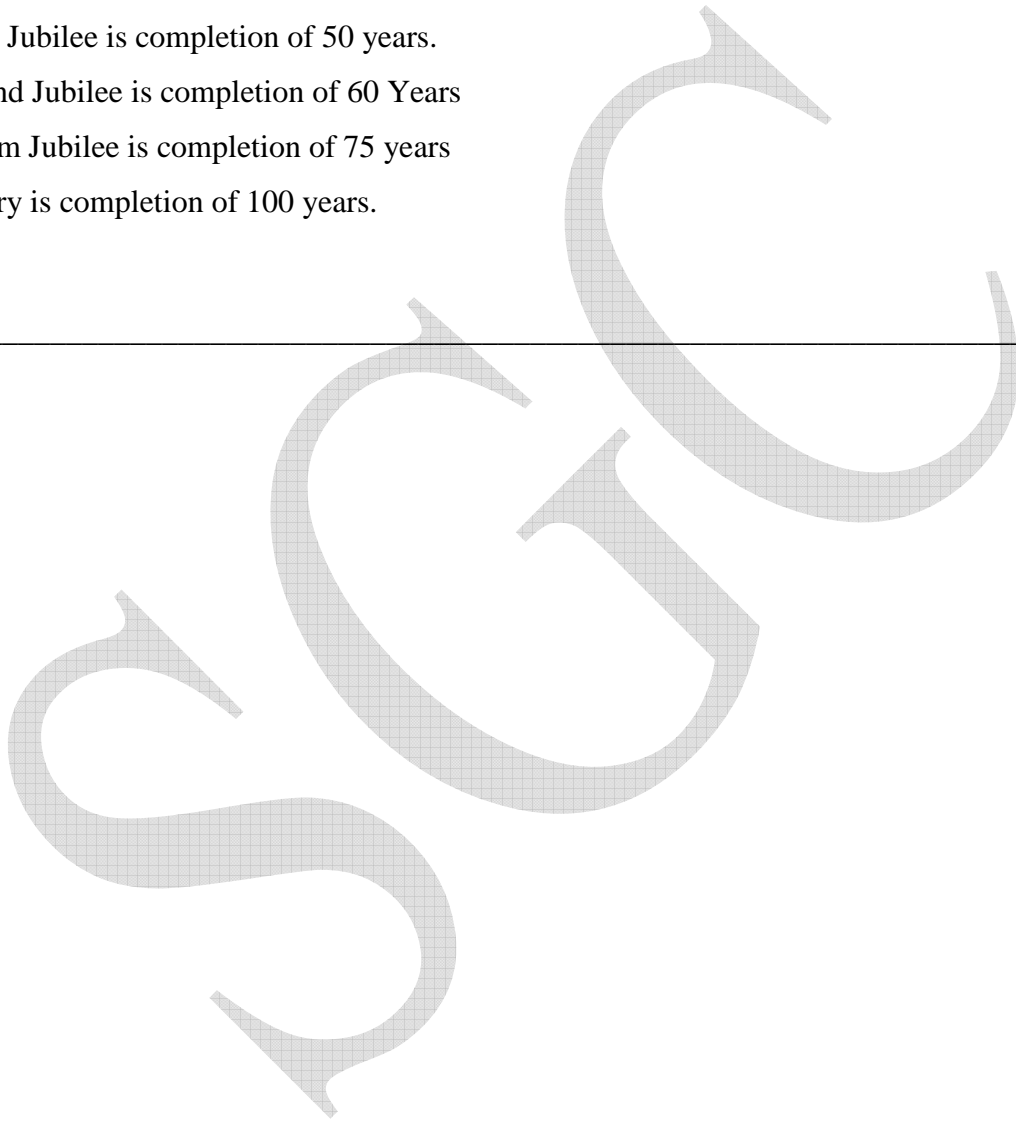
A Golden Jubilee is completion of 50 years.

A Diamond Jubilee is completion of 60 Years

A Platinum Jubilee is completion of 75 years

A Centaury is completion of 100 years.

---



**11. Understanding Greek SYMBOLS**

Name	Greek Capital Letter	Greek Small Letter
Alpha	A	$\alpha$
Beta	B	$\beta$
Gamma	$\Gamma$	$\gamma$
Delta	$\Delta$	$\delta$
Epsilon	E	$\epsilon$
Zeta	Z	$\zeta$
Eta		$\eta$
Theta	$\Theta$	$\theta$
Kappa	K	$\kappa$
Lambda	$\Lambda$	$\lambda$
Mu	M	$\mu$
Nu	N	$\nu$
Xi		$\xi$
Omicron	O	$\omicron$
Pi	$\pi$	$\Pi$
Sigma	$\Sigma$	$\sigma$
Tau	T	$\tau$
Upsilon	Y	$\upsilon$
Phi	$\phi$	$\varphi$
Chi	X	$\chi$
omega	$\Omega$	$\omega$

## 7. Important Symbols in Mathematics

Symbol	Expansion Name	Symbol	Expansion Name
+	Plus; positive; underestimate	$\Sigma$	Summation
-	Minus; negative; overestimate	$\int$	Integral of
$\pm$	Plus or minus; positive or negative	$\equiv$	Identical with
$\mp$	Minus or plus; negative or positive	$^{\circ}$	Degree of
x	Multiplies (colloq'times') (6x4)	$\cup$	Union symbol
$\div$	Divide by (12 $\div$ 4)	$\cap$	Intersection symbol
/	Divided by ratio of (12/4)	$\subset$	Subset of
=	Equals	$\not\subset$	Not subset of
$\neq$	Not Equal to	$\sqrt{\quad}$	Square root
<	Less than	$\sqrt[3]{\quad}$	Cube root
>	Greater than	$\cong$	Congruent to
$\leq$	Less than or equal to	$\Delta$	Triangle
$\geq$	Greater than or equal to	$\perp$	Perpendicular to
$\propto$	Directly proportional to	$\sphericalangle$	Angle
:	Rato of (8 : 10)		Parallel to
::	Proportional equals (3::4 :: 4:8)	$\Rightarrow$	Implies
$\approx$	Approximately equal to	$\therefore$	Therefore
( )	Parenthesis	$\because$	Because
{ }	Braces	%	Percentage
[ ]	Brackets	$\infty$	Infinity
$\in$	Belongs to	$\notin$	Not Belongs to

**8. Square and Cube roots**

Square root is represented by  $\sqrt{4} = 2$

Cube root is represented by  $\sqrt[3]{125} = 5$

Sl.No.	Square	Cube
1	1	1
2	4	8
3	9	27
4	16	64
5	25	125
6	36	216
7	49	343
8	64	512
9	81	729
10	100	1000
11	121	1331
12	144	1728
13	169	2197
14	196	2744
15	225	3375
16	256	4096
17	289	4913
18	324	5832
19	361	6859
20	400	8000
21	441	9261
22	484	10648
23	529	12167
24	576	13824
25	625	15625
26	676	17576
27	729	19683
28	784	21952
29	841	24389
30	900	27000

---

**9. Roman Numbers :**

---

Numbers	Roman Numbers
1	I
2	II
3	III
4	IV
5	V
6	VI
7	VII
8	VIII
9	IX
10	X
11	XI
12	XII
13	XIII
14	XIV
15	XV
16	XVI
17	XVII
18	XVIII
19	XIX
20	XX
50	L
40	XL
400	CD
100	C
500	D
1000	M

If (̄) is placed on the top of the Roman numbers. Its value is increased by 1000 times.

For E.g.  $\overline{V} = 5000$   $\overline{XX} = 20000$

---

**10. Exponents and Rules :**

---

1.  $a^m \times a^n = a^{m+n}$

2.  $a^m \times a^{-n} = a^{m-n}$

3.  $(a^m)^n = a^{m \times n}$

4.  $\frac{a^m}{a^n} = a^{m-n}$

5.  $\left(\frac{a^m}{a^n}\right)^k = \frac{a^{m \times k}}{a^{n \times k}}$

6.  $a^{-m} = \frac{1}{a^m}$

7.  $a^0 = 1$

8.  $a^m \div a^n = a^{m-n}$

9.  $\frac{a^m}{b^m} = \left(\frac{a}{b}\right)^m$

10.  $a^m \times b^m = (ab)^m$