**CLASS-VI**

**Chpter-1.**

Natural Numbers and whole numbers

1. **Roman numerals**
2. **Number line**
3. **Successor and predecessor**
4. **All operation of whole number**
5. **Distributive property**
6. **Solve by rearranging**
7. ROMAN NUMERALS

Hindu Arabic Roman

1 I

2 II

3 III

4 IV

5 V

6 VI

7 VII

8 VIII

9 IX

10 X

20 XX

30 XXX

40 XL

50 L

60 LX

70 LXX

80 LXXX

90 XC

100 C

110 CX

500 D

1000 M

Q. Convert into Roman numerals.

(a) 19 (b) 78

19 =10+9= X IX 78=70+8=50+10+10+8= L X X VIII

C.W:- (a) 58 (b) 91

Q. Convert into Hindu Arabic Numerals.

(a) XXVI = X X VI = 10+10+6 =26

(b) XLl = XL l = 40+1 = 41

C.W. – (a) XCVII (b) LXXXV

H.W. - (a) XXIX (b) XLV

Solve and write the result in Roman.

1. 12x7 = 84 = 50+10+10+10+4 = LXXXIV
2. 216-174 = 42 = 40+2 = XLII

C.W. (a) 32+67 (b) 296-198

H.W. (a) 3645 ÷ 45 (b) 121 ÷ 11

Fill in the blanks .using roman numerals

CXIX - ------------------ = XXV

100 +10+9 - \_\_\_\_\_\_\_\_\_\_ = 10+10+5

119-25 =94

Number is 94

119 -94 =25

94 = 90 +4 = XCIV

CXIX – XCIV = XXV

C.W. - \_\_\_\_\_\_\_\_ +XLVI = LXX.

H.W. – LXX +\_\_\_\_\_\_\_\_ =XCV

Q. **Arrange the following in ascending order**

(a) LVII ,XC ,XV ,LXIV , LXXI

(b) XX ,XIV ,VI ,XL , IX

Q**. Which is meaningless.**

(a) XLI (c) IV C

(b) IC (d) LIL

Q**. Write in roman numerals**

(a) year in which india become republic.

(b) In which years india won the world cup ?

1. NUMBER LINE

(a) Naturals number :- **Numbers start from 1 (1,2,3,….)**

(b) Whole number – **Number start From 0 (0,1,2,3…..)**

….-4 -3 -2 -1 0 1 2 3 4 …….

Naturals numbers

Whole numbers

Q. the smallet +ve number 1

Q. The greatest + ve number not define

Q. The smallest –ve number not define

Q. the greater –ve number -1

Q. The smallest whole number . 0

**(3) Successor and predecessor**

**Predecessor(always left) Successor(always right)**

Q. Success of -

a) -3 (b) 16 (c) -11 (d) 196

(a) -2 (b) 17 (c) -10 (d) -197

Q**.** predecessor of -

(a) -100 (b) 15 (c) 103 (d) -7

(a) -101 (b) 14 (c) 102 (d) -8

Write successor and predecessor of

(a) -1001 (b) 50001 (c) -1

**One digit numbers 0 -9**

**Two digit numbers 10-99**

**Three digit numbers 100-999**

**Four digit numbers 1000-9999**

**Five digit numbers 10000-99999**

**Six digit numbers 100000 – 999999**

Q. **How to find out the smallest and the greater digits number from given digits**

Q. **Form the greatest -7 digits number from 3,8,9.**

**9 9 9 9 9 8 3**

**Use the smallest number at unit** and next greater number at 10 th plane after all are the greatest number.

C.W. Form the greatest 9 digit number from 7,6,5.

H.W. From the greatest 6 digit number from 1,7,4.

**Q. Form smallest 6 digits number from 4 ,5,0 and 6,1,7.**

**4 0 0 0 0 5**

**1 1 1 1 6 7**

**The greatest number unit plane**

C.W.- Form the smallest 8 digit number from 7 ,0 ,4.

H.W. - Form the smallest 7 digits number from 5 ,1,7.

Important points :

**(a) 5 x 0 = 0**

**(b) 81 = 8**

**(c) 5 5 = 1**

**(d) 5 +0 = 5**

**(e) 5-0 = 5**

**H.W.**

9 x1 =……… 4+0= ………

7 1=……… 4-0 =……….

4 4 = …….. 4x0 =……….

(4) Distributive property :

ax(b+c)=axb+axc

ax (b-c) = axb –axc

Q. 52 x (63+37) = 52x63 + 52x37

Q. 76 x (91-18) = 76 x91 – 76 x18

Q. (i) 241 x 107 (ii) 999 x 399

241x(100+7) 399x(1000-1)

241x100+241x7 399000-399

24100+1687 398601

25787

Q. (iii) 85 x15 +15 +x15 (iv) 638x201-638

85x15+15x15 638x201-638x1

15x(85+15) 638x(201-1)

15x100 638x200

1500 127600

C.W. (i) 1009x1392

(ii) 750 x17 +750x38 +27 x750 +18

H.W.

(i) 688x10x437-6880x337

(ii) 98x553

(iii) 788x10x438 – 7880 x 437

(iv) 223x25x6 – 223x10x15

(5) **Rearrange and Solve :**

(a) 125x8x488

125x8x488

1000x488

488000

**(b) 200x625x16x50**

**200x50x625x16**

**10000x10000**

**100000000**

Important Tips :

25 x4=100

50x2=100

125x8=1000

16x625=10000

25x40=1000

C.W. – (a) 200x1975x5

(b) 16x125x8x625

H.W. – (a) 725x25x10x4

(b) 916x125x10x8

(a) 786 +342+ 214

786+342+214

1000+342

1342

(b) 20650+547+938+353

2062+938+547+353

3000+900

= 3900

(c) 1015 +2011-115-211

1015-115+2011-211

900+1800

2700

**Convert into nearest hundred .and ten thousand etc.**

C.w. - (A) 637+908+363

(B) 479+2000+21

H.W. – (A) 1637+1908+363

(B) 786+341-286-141

Q**. Find the least number that should be added to 2000 so that 45 devides the sum exactly.**

45)2000(44

180

200

180

20

45-20=25

2000+25=2025

**(C.W.) Q. Find the least number should be added to 5000 so that 35 devides the sum exactly .**

**(H.W.) Q. Find the least number should be added to 7000 so that 55 divides the sum exactly.**

Q. Find the largest 5 digits number which is exactly divisible by 40.

40)99999(2499

80

199

160

399

360

399

360

39

**99999-39=99960**

**Q. find the largest 6 digits number which is exactly divisible by 50.**

**Q. Find the largest 4 digits number which is exactly divisible by 40.**

**CHAPTER-2**

**FACTORS AND MULTIPLES**

**In this Lesson:-**

**1. Multiples 5. Test of Divisibility**

**2. Factors 6. Prime Factorization**

**3. Prime numbers 7. H.C.F**

**4. Composite numbers 8. L.C.M**

1. **Multiples:-** Multiplication table of that number

Ex. Multiples of 4 is - 4, 8, 12, .……………………..(table of 4)

Multiples of 7 is - 7, 14, 21, ………………………….(table of 7)

1. **Factors: -** A factor of a number divides the number exactly.

Ex. Factors of 12 is ------- 1, 2, 3, 4, 5, 6, and 12.

12 - 1X12 12 - 4X3

12 - 2X6 12 - 6X2

1. -3X4 12 - 12X1

**Prime number: -** A number which has only two factors 1 and itself.

23 - 1X23, 23X1 (23 has two factors 1 and itself 23)

25 - 1X25, 5X5, 25X1 (25 has 3 factors 1, 5, and 25)

**Twin Prime:-**  Two Prime numbers whose difference is 2 are called twin Prime.

Ex:- 3, 5 is a twin Prime because 5-3=2(difference is 2)

5, 7 is a twin Prime because 7-5=2(difference is 2)

**Q. Which is twin Prime 41, 43, or 53, 59**

Ans. 41, 43 is a twin Prim because 43-41=2 9difference is 2)

53, 59 is not a twin Prime because 59-53=6(difference is not 2)

C.W – Q:- which is twin Prime 59, 61 or 79, 83.

Co-Prime:- Two numbers having no common factor except 1 are called Co-Prime number.

Ex:- 3, 5 19, 20

3 - 1X3 19 - 1X19

5 - 1X5 20 - 1X20, 2X10, 4X5, 5X4, 10X2, 20X1

Only One Common factor 1

Q. Which is Co-Prime 5, 11, or 20, 24

Ans. 5, 11 20,24

5 - 1X5 20 - 1X20, 2X10, 4X5, 5x4, 10X2, 20X1

11 - 1X11 24 - 1X24, 2X12, 3X8, 4X6, 6X4, 8X3, 12X2, 24X1

**Sum of two odd Primes:- 18 - 5+13, 7+11 32 - 3+29, 13+19**

**Sum of three odd Primes:- 41 - 5+7+29, 7+11+23**

Composite number: - A number which has more than 2 factors is called Composite numbers.(Numbers which is not Prime they are all composite).

**Important**

1 - neither Prime nor composite

2 - The smallest even Prime number (1x2, 2x1 only Prime even number)

3 - The smallest odd Prime number (1x3, 3x1)

4 - The smallest even composite number because 4- 1x4, 2x2, 4x1

5 - Prime Number (1x5, 5x1)

6- Composite number (1x6,2x3,3x2,6x1)

7- Prime number (1x7, 7x1)

8-Composite number (1x8, 2x4, 4x2, 8x1)

9- The smallest odd composite number (1x9, 3x3, 9x1)

Test of Divisibility

1. **Divisibility by 2:-** It the unit place number is 0, 2, 4, 6, 8 then number is divisible by 2.

Ex. 2424, 7361400, 92466, 9342, 8868

1. **Divisible by 5:-** It the unit Place number is 0 or 5. Then number is divisible by 5.

Ex-73450 964585

Q. Which are divisible by 5

2460, 9254, 6935, 4025, 734605435, 74690346

**Divisible by 10:-** It the unit place number in 0 than number is divisible by 10.

Ex. 9460, 5432050 92540

Q. Which are divisible by 10

34605, 92470, 7347180 31706454

**Important:-** **It unit place contain 0 then its number is divisible by 2, 5 and 10 all.**

**Divisibility by 3 :-** Add all the digits and the sum must be divisible by 3.

Ex 734193 - 7+3+4+1+9+3 =27 (27÷3=9)

547694 - 5+4+7+6+9+4=35 (35 is not divisible by 3)

**Divisibility by 9 :-** Add all the digits and the sum must be divisible by 9.

Ex 7644312 - 7+6+4+4+3+1+2=27 (27 ÷9 =3)

374114 - 3+7+4+1+1+4=20 (20 is not divisible by 9)

**Important:-** **It a number is divisible by 9 it must divisible by 3**

**Divisibility by 4:-** It the last two digits of a number in divisible by 4 then whole number is divisible by 4.

Ex 5476924 24÷4=6 so 5476924 in divisible by 4

976431 31 is not divisible by 4.

**Divisible by 8:-** If the last three digits are divisible by 8 then whole number indivisible by 8.

Ex. 7643328 328 ÷8=41 7643328 is divisible by 8

9276411 411 is not divisible by 8.

**Important:- If a number is divisible by 8 then its number also divisible by 4.**

**Divisibility by 11 :-** If the difference between the sum of even places digits and odd number digits are 0 or divisible by 11.

Ex. 1 3 8 5 6 7 2 2 9 4 3 2 3 9 0 9 0

1+8+6+2 = 17 9+3+1+9+9=31

3+5+7+2=17 4+2+3+0+0=9

17-17=0 31-9=22

22÷11=2

1. If a number divisible by 6 if its divisible by 2 and 3
2. If a number divisible by 12 if its divisible by 2 and 3
3. If a number divisible by 24 if its divisible by 8 and 3
4. If a number divisible by 36 if its divisible by 9 and 4
5. 8 and 12 both are divisible by 4.Then 8+12 =20 is also divisible by 4.
6. 15 and 35 both are divisible by 5. Then 35-15=20 is also divisible by 5.

Prime Factorization: - Number divisible by the smallest to the highest.

2 84 2 1176

2 42 2 588

3 21 2 294

7 7 3 147

1 7 49

84 2x2x3x7 =x3x7 7 7

1

1176 2x2x2x3x7x7=x3x

**H.C.F Common digit with the smallest power.**

**L.C.M Write all the digits one time with the highest power**.

H.C.F and L.C.M by Prime factorization:-

38, 64, 82

2 38 2 64 2 82

19 19 2 32 41 41

1 2 16 1

2 8

2 4

2 2

1

38 - 2x19

64 - 26

82 - 2x41

H.C.F Common digit with smallest Power 2

L.C.M Write all digits one time with highest Power.

26 x19x41=49856

70, 105, 175

2 70 3 105 5 175

5 35 5 35 5 35

7 7 7 7 7 7

1 1 1

70 2x5x7

105 3x5x7

175 5x5x7=5²x7

H.C.F 5 x7 =35

L.C.M 2x3x5²x7=1050

**Important**

1. Consecutive numbers 1, 2, 3, 4, 5, 6,…….
2. H.C.F of two consecutive natural numbers is 1

Ex. 3 3 2 4

1 2 2

1

3 3x1

4 2x2x1

1. H.C.F of two consecutive even numbers is 2

2 4 2 6 4 2x2

2 2 3 3 6 2x3

1 1

d. H.C.F of two consecutive odd numbers is 1

3 3 5 5 3 3x1

1 1 5 5x1

e. H.C.F of two Prime and Co-Prime numbers is 1.

5 5 17 17 5 5x1

1 1 17 17x1

f. H.C.F is not greater than any number.

g. L.C.M is not smaller than any of the number.

h. H.C.F of given numbers in a factor of their L.C.M

i. L.C.M of a given numbers is a multiples of their H.C.F.

j. H.C.F of two numbers is one of a number than L.C.M in the greater number.(If they comes in same table)

5 5 3 15 5 5x1

1 5 5 15 3x5

1 H.C.F 5(smaller)

L.C.M =3x5=15 (greater)

k. L.C.M of Co-Prime number is the Product of the numbers.

L.C.M of 5 and 9 is 5x9 =45

l. **First number xSecond number=L.C.M x H.C.F**

**F.N = L.C.M x H.C.F**

**S.N.**

**L.C.M = F.N x S.N**

**H.C.F**

**S.N = L.C.M x H.C.F**

**F.N.**

**H.C.F = F.N x S.N**

**L.C.M**

Q. Can two numbers have 15 as H.C.f and 350 as L.C.M why?

Ans. No because 350 is not divisible by 15.

Q. Find the greatest number which divides 203 and 434 living reminder 5 in each case. (use long division method).

Ans. 203-5=198

434 – 5 =429

H.C.F = 33

Q Find the least number which when divided by 40, 50 and 60 leaves reminder 5 in each case.

Ans. 2 40, 50,60

2 20, 25, 30

2 10, 25,15

3 5, 25, 15 2x2x2x3x5x5=600

5 5, 25, 5 600+5=605

5 1, 5, 1

1 1 1

Q. Write lowest 5 digit number as a Product of their Prime.

2 10000

2 5000

2 2500

2 1250

5 625

5 125

5 25

5 5

1

100000 24 x54

**Chapter -3**

**INTEGERS**

-∞

∞

5

4

3

2

0

1

-1

-2

-3

-4

-5

Negative integers Positive integers

(Left) (Right)

5 m left = -5 5 m right = +5

7 m below = -7 7 m above = +7

Loss, Decreases, below sea Profit, Increases, above sea

level, south, withdraw= -ive level, north, deposit = +ive

The greatest negative number = -1

The smallest negative number = -∞

The smallest positive integer = 1

The greatest positive integer = +∞

Note: - Zero is smaller from any positive integer and greater than every negative integer.

Comparing - 7 > 5 -7 < -5

15 > 13 -15 < -13

17 > 12 -17 < -12

21 > 20 -21 < -20

0 > -5 0 < 5

0 > -1 0 < 1

5 > -3 -2 < 1

Integer between the given numbers: -

Integer between -5 and 0

∞

-∞

5

4

3

2

0

1

-1

-2

-3

-4

-5

[ -4, -3, -2, -1]

Integer between -4 and 3

-∞

∞

5

4

3

2

0

1

-1

-2

-3

-4

-5

[-3, -2, -1, 0, 1, 2]

Ascending order –(Start from the smallest)

4 , -5 , 16 , -11 , -21 , 50

-21 ,-11 ,-5 , 4 , 16 , 50

Desending order:- (Start from the greatest)

-171 , 26 ,-43 ,103 , -105 , 77

103 ,77 ,26 ,-43 ,-105 , -171

-4 -3 -2 -1 0 1 2 3 4

Natural numbers

Whole numbers

Absolute value:- Absoute of +ve=+ve ,Absolute of –ve=+ve

5 =5 - 5 =5

11 = 11 - 11 = 11

Addition of two positive numbers:-

0 1 2 3 4 5

+2 +3

+5

1. (+3) + (+2) = 5
2. -7 + (+5) = -7 + 5 = -2 [-2-5+5]
3. -12 + (+7) = -12 +7 = -5 + 7 + 7 = -5
4. -6 + (-5) = -6 – 5 = -11
5. -7 + (-2) = -7 -2 = -9
6. -10 - (-5) = -10 + 5 = -5
7. -15 - (-6) – 15 + 6 = -9
8. (-15) - (-5) =- 15+5 = - 10
9. (10) - (-2) = 10 + 2 = 12
10. 3 more than 4 = 4 + 3 = 7
11. 7 more than -10 = -10 + 7 = -3
12. 3 less than -2 = -2 – 3 = -5
13. 7 less than 0 = 0 – 7 = -7
14. 10 less than 0 = 0 – 10 = -10

Additive inverse or negative integers

Additive inverse of 5 = -5

Additive inverse of -10 = 10

Additive inverse of -501 = 50 1

Addition and subtraction:-

1. 300 + (-15) + (-25)

300 – 15 - 25

300 - (15+25)

300 - 40

260

1. (-215) + (-215) + 860 + (-215) + (-215) + 1

-215 – 215 + 860 – 215 – 215 + 1

860 + 1 – 215 – 215 – 215 - 215

861 - (215+215+215+215)

861 - 860

+1

1. (-99) + 7 + (-101) + 93

-99 + 7 -101 + 93

7 + 93 – 99 - 101

100 - (99+101)

100 - 200

-100

1. (-200) - (-100) + (+100) - (-300) - (-400) - (+200)

-200 + 100 + 100 + 300 + 400 -200

100 + 100 + 300 + 400 – 200 - 200

900 - (200+200)

900 - 400

500

1. Subtract of the sum 38 and -49 than -100

Ans (i) sum of 38 and -49

38 + (-49) = 38 – 49 = -11

(ii) subtract -11 than -100

-100 - (-11)= -100 + 11 = -89

1. Subtract -6 from 3 and 3 from -6.are the result same

Ans (i) subtract -6 from 3

3 - (-6) = 3 + 6 = 9

(ii) subtract 3 from -6

-6 – 3 = -9 (NO)

(g) sum of two integers is 48.if one number is -25.Find the other number

Ans x + (-25) = 48

X – 25 = 48

X- 25 + 25 = 48 + 25

X=73

(h) if the difference of two number is -19.if one number is -10 then other number is

Ans X - (-10) = -19

X + 10 = -19

X + 10 – 10 = -19 -10

X=-29

Multiplication of integers

1. (-3) x (+5) = -15
2. (-7) x (-4) = +28
3. (-10) x (-101) = +1010
4. (-3) x (-1) = +3
5. (-1) x (-1) x (-1) = -1
6. (-14) x (-10) x 6 x (-1) = -840
7. (-19) x 7 x 0 x (-5) x 2 = 0

Comparing

1. (7+6) x 10 \_ 7 + 6x10

13x10 \_ 7+60

130 > 67

Important:-

1. 7 negative and 3 possitive =-ve
2. 26 negative and 10 possitive =+ve

If negative in odd numbers it will be –ve

If negative in even numbers it will be +ve

(-1)10 = +1 (-1)9 = -1

(-1)2004 = +1 (-1)1001 = -1

Find the value:-

1. 1234 x 567 – 234 x 567

567 x (1234-234)

567 x 1000

567000

1. 861 x (-3) + (-561) x 7

-861 x 3 – 861 x 7

-861 x (3+7)

-861 x 10

-8610

1. 242 x (-95) + (-242) x 4 - 242

-242 x 95 – 242 x 4 – 242 x 1

-242 x (95+4+1)

-242 x 100

-24200

(d) (-4)3 x (-10)3 x (-1)789

(-64) x (-1000) x (-1)

= - 64000

(e) (-9)3 = (-9) x (-9) x (-9) = -729

Divide:-

1. (-9) ÷ (+3) = -3
2. (-99) ÷ (-9) = +11
3. (-25) ÷ (25) = -1
4. 0 ÷ (-17) = 0
5. 19 ÷ 1 = 19
6. -20 ÷ -1 = 20

Exponent:-

P=power

B=base

23 (two the power three) (-7)4 -minus saven to the power four

(10)7 base=10 power=7

**Chapter - 4**

**Ratio ,Proportion and unitary method**

**RATIO-**Comparing two quantities by division is called ratio.

=5:7= Five is to seven.

Imortant –(A) The two quantities compared should be expressed in the same unit .

(B) The units are not used in ratio.

(C) The quantities should be in same kind if they are not then must be converted into same.

(D) Ratio should be always expressed in the simplest form.

Examples:

1. 1m to 75 cm= = = = 4:3
2. 2 Km to 40 m====50:1

Q. What is the ratio of the prime numbers and composite numbers from the set of natural numbers from 1 to 20 ?

Ans. Prime numbers-2,3,5,7,11,13,17,19=8

Composite numbers-4,6,8,9,10,12,14,15,16,18,20=11

== 8:11 (1 is neither prime nor composite)

**PROPORTION-** A statement of equality of ratio is called proportion .

**Important:** (A) Four terms are used in proportion .

**(**B**)** Proportion is denoted by ::

(C) First and forth terms are called **extermes(a,d)** and second and third terms are called **means(b,c)**.

a : b :: c : d

(D) Product of extermes = product of means

Q. Check 3,4,8,16 are in proportion ?

Ans. 3 : 4 :: 8: 16

Product of extermes = product of means

3x16 4x8

48 ≠ 32 ( not)

**Find the missing value**

Q. Find the missing value of 32,\_,6,12 so that the numbers are in proportion .

Ans. 32,X ,6,12 (Put X in the place of blank)

32 :X :: 6 : 12

Product of extermes = product of means

X x 6 = 32 x 12

X = 32x12

6

X = 64

**Continued proportion**

(A) Three terms

Q. Check 27,36,42 are inContinued proportion ?

Ans. 27 :36 :: 36 : 42 **(In these type of questions middle term write two times)**

Product of extermes = product of means

27 x42 36x36

1134 ≠ 1296 (not)

(B) Two terms

Q. Check 6,8,\_ are inContinued proportion ?

Ans. **In these type of questions second term write two times and put X in the place of blank.**

6,18,18,X

6 : 18 :: 18 : X

6 x X = 18x18

X = 18x18

6

X = 54

UNITARY METHOD –

There are two types

(A) Direct variation (B) Indirect variation

In this class we will learn about direct variation only.

Q. Sahil buys 8 books for Rs.72 What in the cost of 45 books ?

Ans. Books Cost

8 72

X 45

8 : X :: 72 : 45

Product of extermes = product of means

X x 72 = 8 x 45

X = 8 x 45

72

X = 5

Q. A factory produced 57,900 screws in the month of April 2002 every day .

(A) How many screws did the factory produce in 8 days ?

(B) In how many days ,did the factory produse 34,740 screws?

Ans. (A) Screws days

57900 30

X 8

57900 : X :: 30 : 8

X x 30 =57900 x8

X = 57900x8

30 X =15440

(B) Screws days

57900 30

34740 X

57900 : 34740 :: 30 : X

X x 57900 =34740 x30

X = 34740x30

57900 X =18

Chapter - 5

Percentage and its applications

Percentage:- A fraction with denominator equal to hundred is called percentage. The symbol used for percent is % which stands for divided by 100.

**Examples:-** i) 19% = ii) 5% =

iii) 0.275 = = = .00275

iv) 33 % = % = =

v) 20% of 80 = X 80 = 16

vi) 12% of kg

= % of kg

= X

=

viii) Rakesh covered a distance of 350 km .He travelled 70% by train and 28% by bus and the rest by autorickshaw. Find the distance travelled by autorickshaw.

Answer :- Total percent = 100%

Train = 70%

Bus = 28%

Autorickshaw= 100% – ( 70 + 28)%

= 100% - 98%

= 2%

So , 2% of 350 km

= X 350

= 7 Km

Distance travelled by autoricshaw = 7 Km

**Expressing one quantity as a percent of another quantity (convert into %):-**

Q1 What percent Rs 63of Rs 90

Ans. X 100 % = 70%

Q2 Out of 1200 people , 800 know only English. 50 know only Punjabi and rest know both languages .Find the percent of

1. People who English.
2. People who both English and Punjabi.

Ans.

1. X 100 = % = 66%
2. People know both English and Punjabi

= 1200 – (800 + 50)

= 1200 - 850

= 350

= X100 % = %

=%

Profit and loss :-

C.P = Cost price S.P = Selling price

If S.P > C.P = Profit

Profit = S.P - C.P

Profit % = X 100

If C.P > S.P = Loss

Loss = C.P - S.P

Loss% = X 100

Q1 Find

1. The amount 6% more than 120.
2. The amount 15% less than 400.

Ans. a) 6% of 120

= X120 = = Rs7.2

=Rs120+ Rs7.2 = Rs127.2

* 1. 15% 0f 400

= X 400 = 60

=400 - 60 = 340

Q2 C.P = Rs900 S.P = Rs1080

Ans S.P >C.P = Profit

Profit = S.P – C.P

= 1080 – 900

= 180

Profit% = X 100 = X100 = 20%

Q Mr. Gupta purchase a house for Rs 5,00,000 and spends Rs 50,000 on repair , 30,000 on paint , 20,000 on electricity . If he sells it for Rs 8,00,000 . Find his gain percent.

Ans:- Important :- All the expenses before the selling of an article all include in C.P .

So , Total C.P of house = 5,00,000

50,000

30,000

20,000

\_\_\_\_\_\_\_\_\_

C.P = 6,00,000

\_\_\_\_\_\_\_\_\_

S.P = 8,00,000

i) S.P >C.P = Profit

Profit =S.P – C.P

= 8,00,000 – 6,00,000

= 2,00,000

ii) Profit = X 100

= X 100

=

= 33%

Simple interest:-

Two types of interest in the general life .

1. Simple interest.
2. Compound interest.

In this class we learn about simple interest(S.I)

P=Principal

R=rate of Interest

T=Time

S.I. = PxRxT

100

Amount = P + S.I.

Important:- (i) In simple interest time always in years.

(ii) If time in months we divide 12 to convert in year.

6months = = years

9 months= years = years.

(iii) If time in days we divide 365 for ordinary year, and 366 for leap year to convert in years.

**73 days= year = year.**

**146 days = year = year.**

**219days = year = year.**

**292days = year = year.**

**365days = year = year. =1 year**

Q. If P = 2000 ,T = 6 months ,R = 4.5%

Amount=?

Ans:- T = 6 months = year = year

S.I= = = 45

Amount= P+ S.I.

= Rs 2000+Rs45

=Rs 2045

**Chapter – 6**

**Introductim of algebra**

Perimeter =P , Area = a , Length =l , breath =b , Height = h

Letters of alphabets used to B represent number are called literal number or literals .

**Example-** (i) 7less than x = x-7

(ii) M increased by 2 = m+2

(iii) One third the sum of a and b= (a+b)

(iv) Anshul is z year old.How was he 3 year ago? =z-3

(v) 3 times x = 3x

(vi) 4 more than sum of a and b = a+b+4

**Write the following in words –**

1. X+5 = 5 more than x
2. (ii) 2a+3b = 2 times a add 3 times b

**Important :-**

(i) French mathematician ‘ fancois viete ’ is called the father of algebra.

(ii)Indian mathematician aryabhatta is said to have introduced algebra in India .

(iii)The word algebra in derived from the little of the book .algebra w al- almugatalah written by an arab mathematician ‘ Mohammed Ben Muse ’ .

**Exponential form of :-**

**Enponent form = (base )power**

Ex . :- (i) X x X x X x X = X4

1. 3 x a x a x b x b x b xc xc x c x d = 3a2b3c3d .
2. (-3) x X x y x y x z = -3xy2z

**Write the product form –**

Ex. – (2n)5 = (2n) x (2n) x (2n) x (2n) x (2n)

(zn)30 = (-z) x (-z) x (-z) x ……………..x30 times

**Write the coefficient of :**

1. A in -9a = 9
2. Ai n - ab2c = b2c
3. x2 y in 4x2yz = 4z

**Write the numerical coefficient in :** (a) 2n= 2

(b) –yz = -1

(c) –x= -1

(d) x2yz = 1

(e) n2z =

Constants and variables statement - it the statement says about fats than its constant and its change its variable .

Ex.- (i) Temperature in a day . (**Variable**)

(ii)Number of letters in the word MTHEMATICS’ (**Constant** )

(iii)Number of days in February (**variable**)

**Like & Un Like Terms :**

1. **Like term –** Terms having the same variable are called un like terms .

**Ex. – 3x ,5x -2x , x , x**

1. **Un like terms –** Terms having different variable are called unlike terms

3x , -4y , z2 , 5t .

Checked & identify the like terms

3y , 7z , 39x2 , y2 , 4z , -4z , -9y , -x2 , y2

**Names of Expression –**

1. **Monomial – If a expression contain one term is called monomial.**

**Ex. – 3x ,4y ,9t , a**

1. **Binomial - If a expression contain two terms is called binomial.**

Ex. – 3a+b ,-a+b , 3p+4q

1. **Trinomial - If a expression contain three terms is called trinomial.**

**Ex. – 3x-y+z ,2a+b-c .**

1. **Quadrinomial - If a expression contain four terms is called quadrinomial .**

**Ex.- x-4y+7z+9**

Q. Is 4x+3y+2x is trinomial expression ? why?

No because 4x+2x+3y

6x+3y

It’s binomial.

**Write in the form of algebraic expression .**

Ex.- (i) 2a ,3b ,-2c ,-7 = 2a+3b-2c-7

(ii) 4x2 y ,-2xy 2 , -3z2,4 = 4x2 y-2xy2-3z2 +4

**Addition and** **Subtraction - There are two methods-**

1. Column method
2. Horizontal method
3. Column method –

Add the following 2x+7y-2z-5 and 7x-4y +z-2

2x + 7y - 2z - 5

7x - 4y + z - 2

9x + 3y - z - 7

Subtract the following 2x+7y-2z-5 from 7x-4y +z-2.

7x - 4y + z - 2

2x + 7y - 2z – 5

- - + +

5x – 11y +3z +3

1. Horizontal method

Add the following 2x+7y-2z-5 and 7x-4y +z-2

7x - 4y + z - 2 + 2x + 7y - 2z - 5 = 9x + 3y - z -7

Subtract the following 2x+7y-2z-5 from 7x-4y +z-2.

7x-4y +z-2 – (2x+7y-2z-5) = 7x-4y +z-2 –2x- 7y + 2z + 5

= 5x - 11y + 3z + 3

**Finding the value of an algebraic expression** –

In this for motion we put the given the value in the places of veraibles.

Ex.- if a=1 ,b=5 ,c=-3

The find the value of 3ab-4bc+3ac-5

3(1) (5)-4(5)(-3)+3(1)(-3) -5

15+60-9-5

75-14

61

Ex.- If z=-9 find the value of z +6 = +6= -6+6= 0

**Chapter – 7**

LINEAR EQUATION

**A statement of equality which contains literal number is called an equation**.

An equation in which power (degree) of literal number (variable) is one is called a linear equation.

X+5 (LHS) = 4 (RHS)

Ex. (i) P+5=7 (ii) X-5=9 (iii) 2Y+4=5

Important-An equation in which have more than one power is not a linear equation.

Ex. (i) X2-5=4 (ii) 3X3-4=9

**Convert the following into an equation**

1. 5 added to a number y is 9

Y+5=9

1. Two –third a number X is 5.

X=5

1. Six times a number Y is 3 more than the itself.

6Y+3=Y

**Solving the linear equation**

**Type-1**

Q. 6 is the solution of 10Y=80

Ans. (Put 6 in the place of Y)

LHS 10(6)

60 80 (NO)

Q. 3 is the solution of 2X+1=7 ?

Ans. LHS 2(3)+1=6+1=7 =RHS(Yes)

**Type-2**

**Q. x+9 =15**

**X+9-9 =15-9**

**X = 6**

Q. 7-Y=10

7-Y-7=10-7

-Y=3

Y=-3

**Type-3**

**Q. 8 X = 24**

x =

X = 3

**Type-4 Type -5**

Q. = 4 Q. 3(X+1) =6

= 4x5 3(X+1) = 6

X = 20 3 3

**Type-6** X+1 = 2

Q. 2X+1 =5 X+1-1 = 2-1

2X+1-1 = 5-1 X = 1

2X = 4 **Type -7**

= Q. X – 5 = 3

X = 2 4

**Type-8** 4(X-5) =4x3

Q. = 6 4

x = 6 x X-5 = 12

P = 9 X -5+5 = 12+5

**Type-9** X = 17

Q. 5Y+10 =4Y-10 **Type -10**

5Y+10-10 = 4Y-10-10 Q. Y + = 5

5Y = 4Y -20 Y+ -= 5 –

5Y -4Y = 4Y-20-4Y Y = 5 x -

Y = -20 Y = -

**Type-11**  Y =

**Q.** X + 3 = 5

X + 3 - 3 = 5 - 3

X = 2 X = 4

**Chapter-8**

**Basic Geometrical Concept**

**Point – A Geometrical figure which has no length , no breath and no height is called point .**

A B Line - A Geometrical figure which has no end point . it moves straight in both direction.

(l) Line can also represent as line AB , line l.

Line segment – A line segment is a potion of a line which has two end points it has a definite length . Ex.- 5cm ,10cm , etc.

O x Ray – A Geometrical figure which has one end point it extends endless in one direction.

How many line segment in figure ?

12

7

Plane :- Plane is a flat surface which extends infinitely in all direction . Ex .- table top , Black Board

Curved surface – Surface which are not flat all are curved surface . Ex.- ball , orange , glob , pencil , pen .etc.

Lines – There are three types of line – (i) parallel lines

(ii) Intersecting line (iii) Concurrent line

1. Parallel lines - Two lines in a plane which do not meet any where in a plane are called parallel line

**Important - Distance between the parallel line are always’s equal at any where** .

1. Inter section line - Two line in a plane which cut each other at one point are called intersecting lines .

Point of inter section

**Where the points meet is called the point of intersection** .

1. Concurrent line – (i) Unlimited lines can be passing through from a given point.
2. More than two lines can be passing through from a given point.

Points of concurrence

**The point through which these lines are passing is called points of concurrence** .

Important – Only one line can be drawn from two given point but infinite line can be drawn from indival points .

Collinear Points – Three or more points in plane which line on a same line are called collinear points.

Q. In the figure name

(a) The line concurrent at point A

(b) The sets of collinear points

BDC , AGD , BGE

1. The point intersection of line J ,P , M ,
2. Two pairs of intersecting lines

D(l r) E (m q)

(IV) perpendicular lines – If the lines make 900 angle with each other is called perpendicular lines

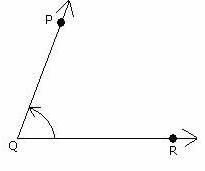
C

900 900

A D B

**Chapter -10**

**Angles**

**(vertex)**

Angle PQR

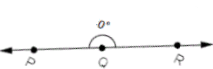
Vertex - Q

Arms -QP,QR

Angles Measure in degree.

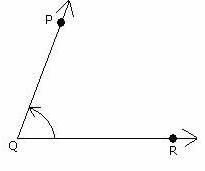
**Types of angles**

1. **Zero Angle:-**

****

No angle between the two arms QP and QR is called zero degree angle.(two arms overlap)

**2. Acute Angle:-**

****

Angle between two arms is less then 900 And greater then 00 is called acute angle

**00 <  < 900**

**3. Right Angle:-**



Angle between two arms is 900 is called right angle.

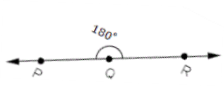
**4. obtuse Angle:-**

****

Angle between two arms is more then 900 And less then 1800 is called obtuse angle.

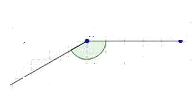
**900 <  < 1800**

**5. Stright Angle:-**

****

Angle between two arms is 1800 is called stright angle.

**6. Reflex Angle:-**



A Angle between two arms is greater than 1800  and less than 36**00** is called reflex angle.

**1800 <  < 3600**

**7. Complete Angle:-** A Angle is 3600 then its called complete angle.

**(Right angle)**

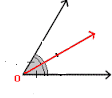
**(Acute angle)**

**Zero Angle**

**(Vertex Angle)**

**Pairs of angles:-**

1. **Adjecent Angle:-**

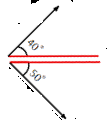
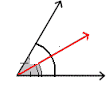
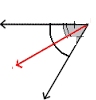
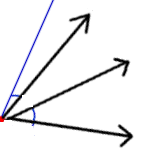
****

Two angles are Adjacent if

(i) They have a common vertex

(ii) They have a common arms

(iii) The other two non-common arms lies on the opposite sides of the common arm.

**   **

**Linear Pair:-** Two adjecent Angles form a linear pair if their non-common arms from a stright line and the sum of all angles are180

**Vertically Opposite Angles:-**

Two Angles formed by two intersecting lines having no common arm but a common vertex are called opposite angles.

**<1=<2**

**<3=<4**

<1+<3=1800 1

<3+<2=1800 3 4

<2+<4=1800 2

<4+<1=1800

<a=500

<b=1800-500=1800

<c=1300

**Complementary angles:-** Two angle whose sum in 900 is called Complementary angles.These angles adjecent as well as non-adjacent angles.

a+300=900

a=900-300

a=600

**Question:- Write the complement angle of** 710

**ans: 90-71 = 19**

**Supplimentory angles:-**

Two Angles whose sum of **1800** Are called supplementary angle.These angle are adjacent as well as non adjacent angles.

a+800=1800

a=1800-800

a=1000

**Question:- write the Supplement angle of** 930

**ans:**- **1800- 930=870**

Question:- How many degree are there in:-

(a)2/3 right angle x**900**=**600**

(b)5/6 stright angle x**900**=75**0**

(c)2/15 complete angle x**3600**=**480**

Question:- kind of Angles:-

WN N NE

W E

SW ES S

(a) North and south = straight angle

(b) North and North West = acute angle

(c) South and east = right angle

(d) East and West = straight angle

(e) East and North West = acute angle

(f) East and West south = Reflex angle

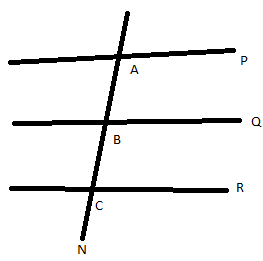
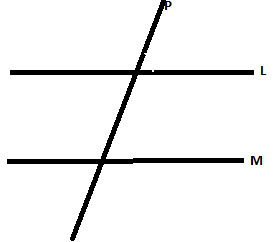
(g) East and south west = obtuse angle

(e)East and west north = Reflex angle

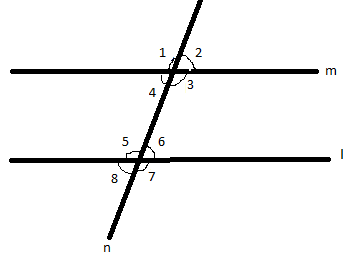
Chapter-11

Pairs of Lines and Transversal

Transversal:-A line which intersect two or more lines at different points is called transversal to the given lines.



When a transversal intersect two line in a plane, eight angles are formed.



1. Interior angle:- <3,<4,<5,<6

2.Exterior angles:- <1,<2,<7,<8

3.Corresponding angles:- <1=<5

<2=<6

<4=<8

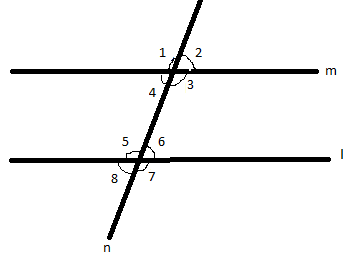
<3=<7

4. Alternate interior angle:- <3=<5

<4=<6

5. Alternate Exterior angles:- <2=<8

<1=<7



6. Linear Pairs:- <1+<2=1800

<2+<3=1800

<3+<4=1800

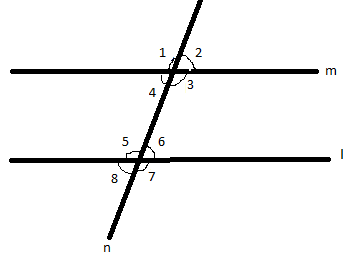
<1+<4=1800

<5+<6=1800

<6+<7=1800

<7+<8=1800

<5+<8=1800



7.Interior 0ppangles:- <3+<6=1800

<4+<5=1800

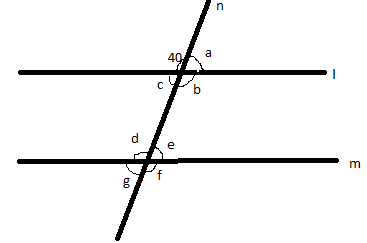
8.Vertically opp.angles:- <1=<3

<2=<4

<5=<7

<8=<6

Question:-Find all the angles



<b=400 V.O.A

<b=<d=400 Interior opp.angle

<d=<f=400 V.O.A

a +400=1800

a +400-400=1800-400

a=1400

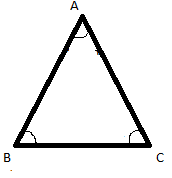
<c=<a=1400 V.O.A

<c=<e=1400 Interior opp.angle

<e=<g=1400 V.O.A

Chapter 12

Triangle



A closed three sides figure is called Triangle.

1. There are three sides AB,BC,CA
2. There are three angles

(i)<BAC,<CAB

(ii)<ABC,<CBA

(iii)<ACB,<BCA

1. There are three vertex A,B,C

A triangle has three sides,three vertexes and three angles

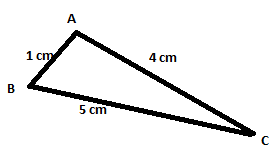
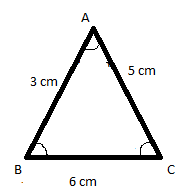
TYPES OF TRIANGLE:-

We can classified the triangle on two basis:-

1. On the basis of sides
2. On the basis of angle

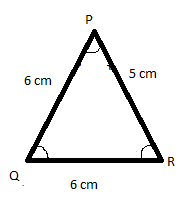
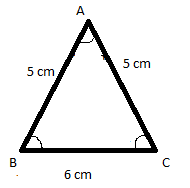
(i)On the basis of sides:-

1. Scalene:-All the three sides are different in length is called scalene triangle.



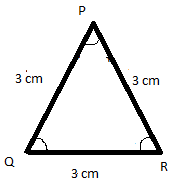
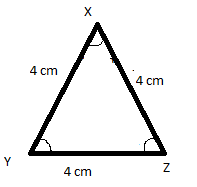
AB≠AC≠BC AB≠AC≠BC

1. Isosceles:-Any two of the sides are same in length is called isosceles.



AB=AC≠BC PQ=QR≠PR

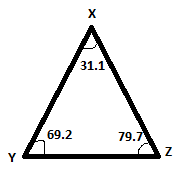
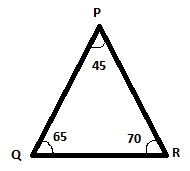
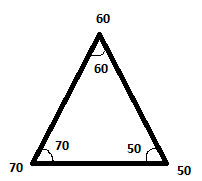
(C) Equilatered:-All three sides are same in length is called equilateral.



AB=AC=BC PQ=QR=PR

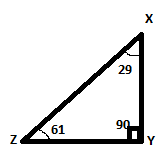
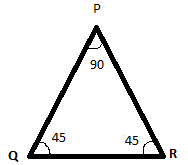
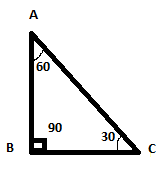
1. On the basis of angle:-There are three types of triangle on the basis of angles.

Acute angled triangle:-If a triangle contain all three angles less then 900 is called acute angled triangle.



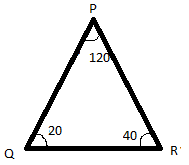
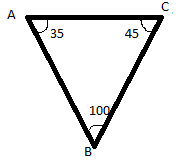
600+700+500=1800 450+650+700=1800 31.10+69.20+79.70=1800

Right angle triangle:-If a triangle contain one angle in 900 and rest two are acute is called Right angled triangle.



Important:-we can’t construct two right angle in a single triangle because the sum of three angle must be 1800 in a triangle but two right angle will be 900+900=1800 and one angle 900+900 +a=1800+a(More than 1800)

Obtuse angled triangle:-if a triangle contain one angle more then 900 and rest two are acute is called obtuse angled triangle.



Important:- (i)we can’t construct two obtuse angle in a triangle because the sum of two angle will be more then 1800 and the third angle has left.

More than 900+ more than900+a=more than 1800+a

(ii ) we can’t construct triangle with obtuse angle and right angle because the sum will be more then 1800

More than 900+900+a =more than1800+a

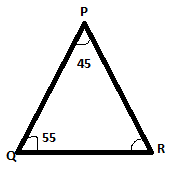
CONSTRUCTION OF TRIANGLE:-

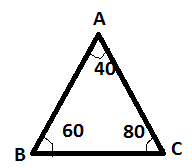
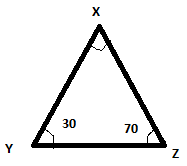
There are two types:-

1. On the basis of sides
2. On the basis of angle

(i)On the basis of angles:-the sum of all the three angles in 1800

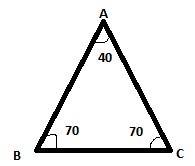
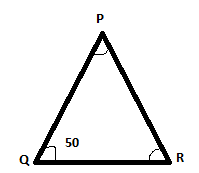
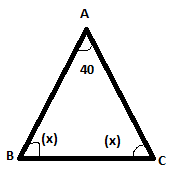
(a)Scalene triangle :-all angle are different so, all sides are also different.

450+550=1000+800=1800



400+600+800=1800 1800-1000=800

(b)isosceles Triangle:-two angles are equal so two sides are also equal

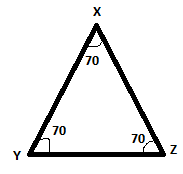
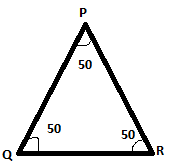
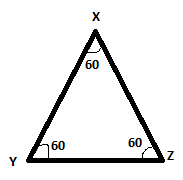


1800-400=1400 ? ?

1400/2=700

Angle x = Angle x =700

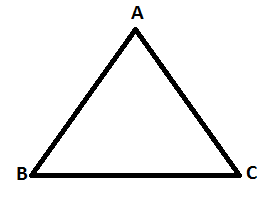
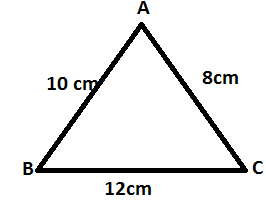
(c)Eqvilaternal triangle:-All the sides are equal and all the angles are also equal .They must be 600,600,600



600+600+600=1800 500+500+500=1500 700+700+700=2100

1500<1800 2100>1800

(ii)On the basis of sides:-The sum of two sides of a triangle is greater than the third side.

** AB+BC>AC 10+12=22>8**

**AB+AC>BC 10+8=18>12**

**AC+BC>AB 12+8=20>10**

If its not happened then we can’t Construct the triangle

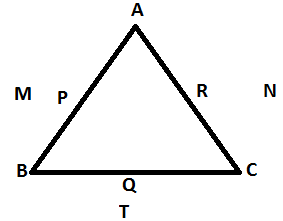
(1)a=5cm b=10cm c=15cm 5+10=15=15

(2)a=10 b=8cm c=20cm 10+8=<18<20

So ,in above two condition we can’t construct the triangle.

Triangular Regians:-

The vertex and the points which are on the triangle and interior of the triangle is called Triangular region



A,B,C,P,Q,R,X,Y,Z

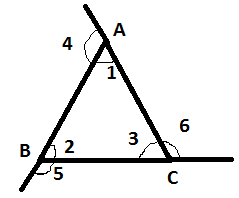
M,N,T are exterior of the triangle is not in Triangular Region

Exterior angle of triangle:-

Interior angles:-<1,<2,<3

<1+<2+<3=1800

Exterior angles:-<4,<5,<6



Exterior angle Interior opposite angles Interior adjecent angles

<4 <2,<3 <1

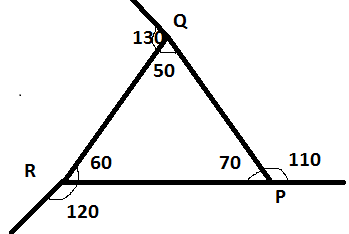
<5 <1,<3 <2

<6 <1,<2 <3

Important:-

1. Every Exterior angle is equal to sum of interior opp. Angles.

<4=<2+<3 <5=<1+<3 <6=<1+<2

 1300=600+700=1300

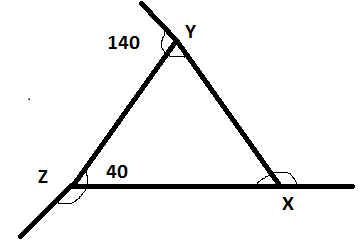
1200=500+700=1200

1100=500+600=1100

1. The sum of every Exterior and interior adjacent angle is 180 0

1300+500=1800 1200+600=1800 700+1100=180

1. Sum of all three exterior angle are always 3600

 1300+1200+1100=3600

P

Q R

Side opp. to vertex P is QR

Side opp. to vertex Q is PR

Side opp. to vertex R is PQ

Vertex opp. to side QR is P

Vertex opp. to side PR is Q

Vertex opp. to side PQ is R

Question:-in the figure ,name the triangle which have

A

D

B F C

A as one vertex

ΔAEC, ΔAED,-----------

1. B as one vertex

ΔBPD,ΔBAP,-----------

1. E as one vertex

ΔEPC, ΔEDP,------

1. DF as one side

ΔDFE, ΔDFC------

1. BC as one side

ΔBCD,------

1. AE as one side

ΔAEC,--------

CHAPTER -13

CIRCLE

C

G

F

E

B

A

H

D

A round plane Figure is called Circle.

1. o is the center of circle .
2. Radius:-Radius is the line segment joining the center of the circle to any point on the circle i.e. OA,OB,OC,OD.we can draw infinite numbered radii in a circle ,and all the radii are equal.
3. Diameter:-A line Passing through the Centre of the circle and touches end points on the circle i.e AB,CD. we can draw infinite number of Diameter in a given circle.

Important:-AB=OA+OB

AB=OA+OA

AB=2OA

Diameter=2xradious

So, radious=Diameter/2

1. Chord:- A chord is a line segment whose end points lie on the circle but not passing through the center of the circle i.e EF,GH

Important:- Diameter is the longest chord of a circle.

1. Arc:-A small part of circle is called arc

R

Q

B

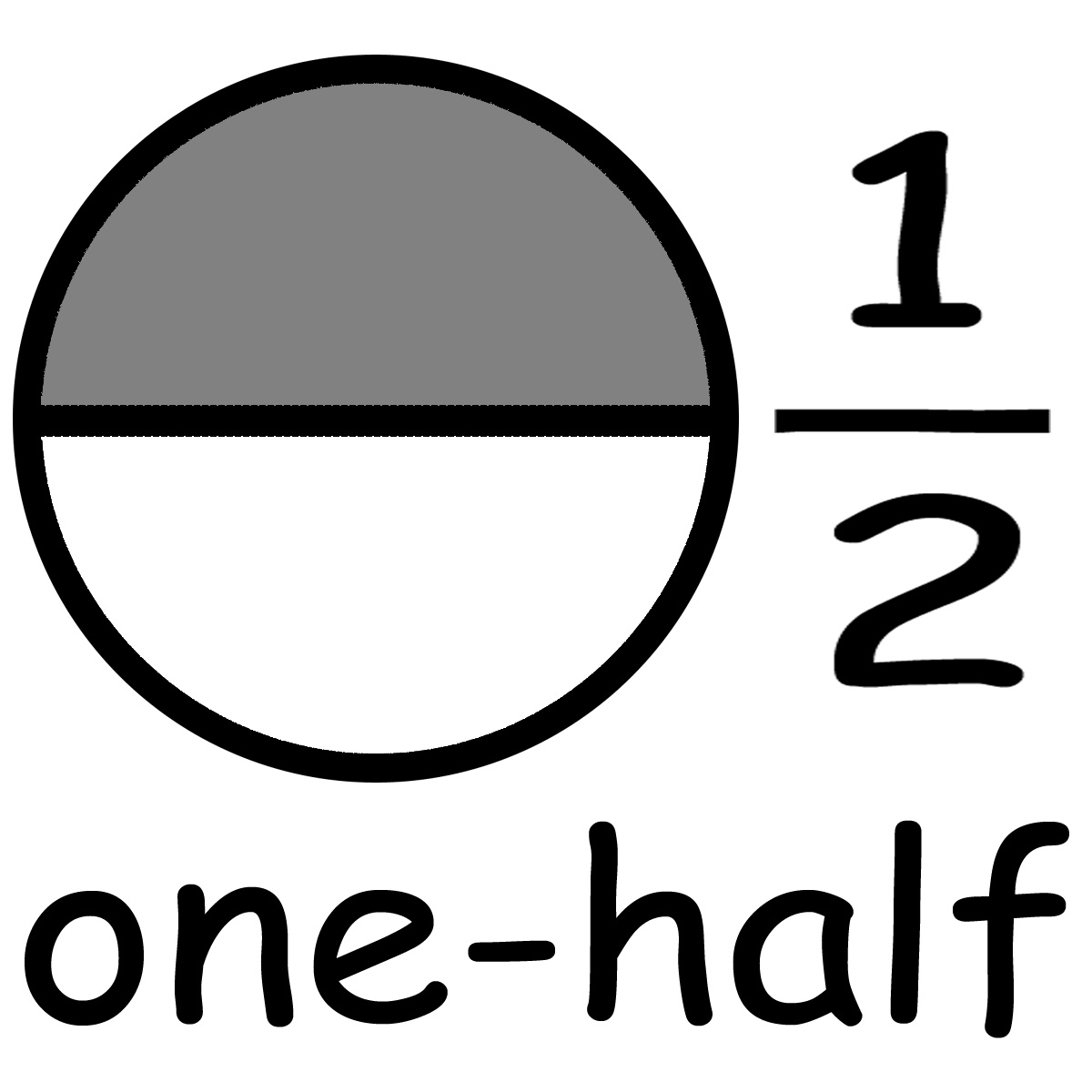
A

P

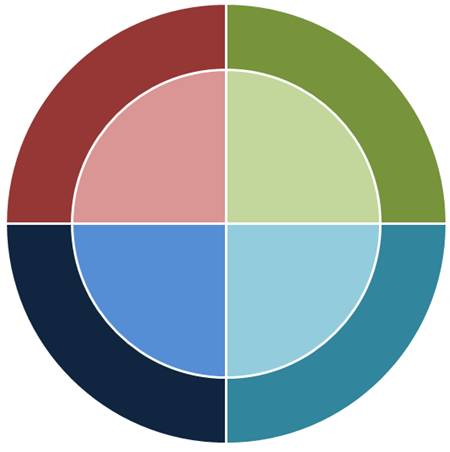
C

Circumference of a circle: - Parameter of a circle is called circumference of a circle i.e. boundary of a circle is called circumference.

Semicircle: - A diameter divides circle in two half parts and these parts are called semicircle.



Quarter: - Two diameter divides the circle in four parts and these parts are called quarter.



**Important**:- If radius in 8cm then diameter is 16cm

If diameter is 12cm then radius is 6cm

Q. Look at the circle carefully and answer the question.

C

A

O

B

X

G

F

E

D

(a) Name of two diameters –BG, CD

(b) How many chords are there – 4 (BC, CG, DG, BD)

(c) Name of all radius - OB, OC, OD, OG

(d) Name of two arcs – BAC, DEG

(e) Name semicircles – BAG, CAD, BEG, CED

(f) Is FO is a radius – NO

(g) Is CX is a chord – NO.

**Chapter -15**

**PERIMETER & AREA**

**Perimeter –** The length of the boundary of a figure .

A

C

B

P = a + b + c

a

a

b

b

Rectangle

P = a + b + a + b

P=2a+2b

P=2(a+b)

a

a

Square

a

P = a + a +a + a

P = 4a

c

B

A

d

b

F

C

e

a

f

E

D

P = a + b + c + d + e + f

a

B

A

b

d

e

c

D

C

P = a + b + c + d

(e is not in perimeter)

**Area** – The region covered by the perimeter is called area.

L

L x B

B

B

L

Perimeter of rectangle = 2(L+B)

Perimeter of square = 4x side

a

a x a

a

a

a

Area of rectangle = LxB

Area of square = side x side

Q. Find perimeter and area of rectangle whose length is 12 cm. and breadth is 10 cm.

Ans. P of rectangle = 2(L + B)

= 2(12 + 10)

= 2 x 22

= 44 cm.

Area of rectangle = Lx B

= 12 x 10

= 120 cm.2

Q. Find the perimeter and area of square whose side is 9 cm.

Ans. P of square = 4 x side

= 4x9

= 36 cm.

Area of square = sidexside

= 9 x 9

= 81 cm2

Area of rectangle = L x B

L = Area / B

B = Area / L

Q. If area of rectangle is 1000 cm2. If the length is 100 cm. then what is the breadth?

Ans. B = Area / L

= 1000 cm2 / 100 cm

= 10 cm.

Area of Square = side x side

Side = Square root of area of square

Q. Perimeter of a square lawn is 72 cm. then find its area.

Ans. P of square = 72 cm.

Side = 72 / 4

= 18 cm.

Area of square = sidexside

= 18 x 18

= 324 cm2

**Important: -**

Q. What will happen to the area of square when

(a) Its side is doubled ?

(b) Its side is half ?

2x

2x

x

1

x

x

2

2x

Area 1 = side x side

= Xx X= X2 cm2

Area 2 = side x side

= 2x x 2x = 4x2 cm2

Area 2 = 4 x Area 1

Area 2 = 4 times of area 1

(b)

x/2

x

x

x/2

x/2

x

1

2

x/2

x

Area 1 = side x side

= x \* x = x2 cm2

Area 2 = side x side

= x/2 \* x/2 = (x2 cm2)/4

Area 2 = ¼ x Area 1

Area 2 = 1/4 times of area 1