Ratio, Proportion And Unitary Method

1. Write the ratios in the simplest form:

i)	15 minutes to one hour	viii)	2cm to 4 cm	xv)	750g to 3kg
ii)	600g to 1 kg	ix)	4 days to 2 weeks	xvi)	8days to 6 weeks
iii)	50p to Rs. 2.50	x)	3 yrs. To 6 months	xvii)	450ml to 3l
iv)	2l to 800 ml	xi)	45 sec to 3 min	xviii)	8mm to 1cm
v)	80cm to 4 m	xii)	45cm to 3m	xix)	Rs. 1.50 to 25p
vi)	3 km to 600m	xiii)	30 min to 4 hours	xx)	4 months to 4yrs
vii)	3 dozen to 3 scores	xiv)	Rs. 1500 to Rs. 18000	xxi)	294 : 343

2. Divide Rs. 1450 between A and B in the ratio 2 : 3

3. Dr. Suma earns Rs. 50,000 p.m. she spends Rs. 42,000 of it and saves the rest.
   Find the ratio of
   i) Her expenditure to her income
   ii) Her saving to her income
   iii) Her expenditure to her savings

4. Fill in :

i)	3:5 = ____ : 15	v)	6:7 = ____:49	ix)	5:30 = ____:6
ii)	6: ____ = 12:30	vi)	____:5 = 20:25	x)	7: ____ = 49:63
iii)	____:11 = 12:22	vii)	3: ____ = 5:10	xi)	1:11 = 9: ____
iv)	9:13 = 27: ____	viii)	45:15 = 3 : ____	xii)	____:13 = 18:117

5. Meena got Rs. 600 as her share from Rs. 2000. Tina got Rs. 750 as her share from Rs. 3000.
   Express their shares as ratios in the lower terms. Compare and find who got more.

6. Fill in the blanks with >, = or <

i)	7:10 ____ 5:10	ii)	6:7 ____ 6:11	iii)	4: 5 ____ 8:10
iv)	9:13 ____ 9:15	V)	11:20 ____ 9:20	VI)	4:9 ____ 12:27

7. The ratio of the length of a rectangle to its breadth is 3:2. If the perimeter of the rectangle is 20 cm find the length, breadth and area.

8. Fill in :

i) 2:4 :: ____:10 ii) ____:8 :: 1:4 iii) 3:8 :: 15: ____

iv) 1: ____ :: 3:15 v) 9: ____ :: 90:100

9. The cost of 4 pens is Rs. 40. The cost of 11 pens is Rs. _____.

10. The weight of 15 boxes is 60 kg. The weight of 12 boxes is _____.

11. Maya can walk 6km in 2 hours. In 3 hours she can walk _____.

12. Dinner at Marhaba costs SR 1050 for 10 people. How many people can have dinner for SR 1995?

13. A car travels 95 km in 5 litres of petrol. How far can it go in 11 litres of petrol?

Elementary Shapes

1. Given below are the lengths of the sides of triangles. Classify them as equilateral, isosceles or scalene

i) 6cm, 2.4cm, 6cm ii) 7cm, 9cm, 5.5cm iii) 5.4cm, 7cm, 6.1cm

iv) 7.2cm, 7.2cm, 7.2cm v) 10.1cm, 8.6cm, 8.6cm vi) 3.5cm, 4.5cm, 5.1cm

vii) 4.8cm, 4.8cm, 4.8cm viii) 6.8cm 6.8cm, 8.6cm ix) 3cm, 4cm, 5cm

2. Draw a triangle ABC using a protactor, measure $\angle A$, $\angle B$ and $\angle C$. Find their sum. What do you notice. Also measure the sides AB, BC, AC. What kind of a triangle is this?

3. Given below are the measures of the angles of some triangles. Classify them As acute-angled, obtuse-angled or right-angled.

i) 60^0, 90^0, 30^0 ii) 40^0, 100^0, 40^0 iii) 60^0, 60^0, 60^0

iv) 20^0, 40^0, 120^0 v) 50^0, 60^0, 70^0 vi) 45^0, 45^0, 90^0

4. Draw a triangle ABC. Measure the sides AB, BC, AC

Verify i) AB + BC > AC ii) BC + AC > AB iii) AB + AC > BC

5. Write the number of sides of the following Polygons: Triangles, Pentagon, Quadrilateral, Heptagon, Hexagon, Nonagon, Octogon, Decagon.

6. Fill in:

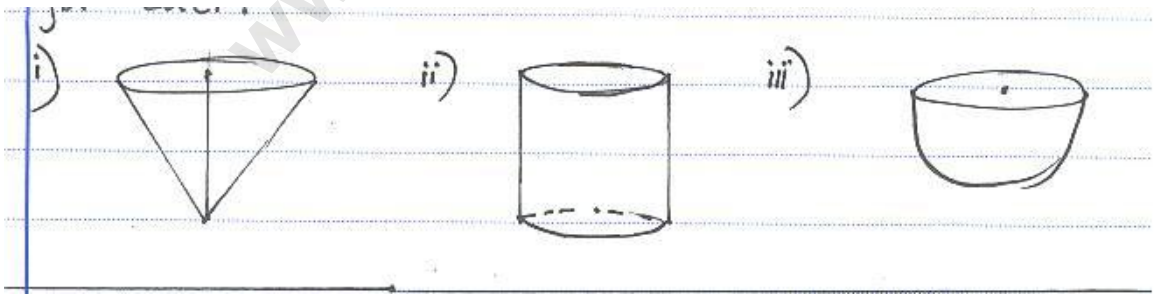
	Number of		
Name of the Solid	Faces	Edges	Vertices
Cube			
Cuboid			
Square Pyramid			
Triangular Pyramid			
Triangular Prism			

7. Write yes of No

Quadrilateral	Opposite Sides		All Sides Equal	Opposite Angles Equal	All Angles Equal	Diagonals		
	Parallel	Equal				Equal	Perpendicular	Bisect each
Trapezium								
Parallelogram								
Rhombus								
Rectangle								
Square								

8. Name each of the following 3 – D shapes. Write number of Curved Surfaces and no of

flat faces.



Symmetry

1. Look around and list any five things from your surroundings that are symmetrical
2. Write any 3 English alphabet, which are symmetrical and have

i) One axis of symmetry

ii) Two axes of symmetry

iii) More than two axes of symmetry

3. Draw an angle of any measure. Using a ruler and protractor draw the line of symmetry (angle bisector).

4. Write the no. of axes of Symmetry of

i) Square

ii) Rectangle

iii) Circle

iv) Scalene Triangle

v) Equilateral Triangle

vi) Rhombus

Geometrical Constructions

1. Construct the following angles using a ruler and compasses

i) 60^0 ii) 120^0 iii) 30^0 iv) 90^0 v) 45^0

2. Draw an angle of measure 100^0 using protractor. Draw an angle equal to to this angle without using protractor. Draw the bisector of this angle.

3. Draw a circle of radius 4cm. Inscribe a regular hexagon in it.

4. Draw a line-segment AB of any length. Draw the perpendicular bisector of it.

5. Draw a line 'l'. Take a point P outside the line 'l'. Draw a perpendicular line to 'l' from P.

Perimeter And Area

1. Which has greater perimeter? - a regular pentagon of 10 cm side or a rectangle with side 17 cm and 12 cm.

2. A wire bent in the shape of a rectangle of sides 13.5 cm by 6.5 cm was straightened and re-bent into a square. Find the length of the side of the square.

3. The cost of fencing a square field was Rs. 1380 @Rs. 15/m Find the side of the square field And hence find its area.

4. A wire was bent to make a square of side 10.5 cm The same wire is re-bent to make a regular hexagon. Find the length of side of the hexagon.

5. Area of a rectangle is 24 cm^2. If its length is 6cm find its width. Find the area of a Square whose perimeter is same as of this rectangle.

Whole Numbers

Fill in the blanks :

1. $25 \times 8 \times 125 \times 4$ = _____
2. $315 \times 105 = 315 \times 100 +$ _____ $\times 5$
3. Division by zero is _____
4. The whole number _____ has no number .
5. The smallest natural number is _____.
6. The sum of 3 odd numbers is _____.
7. _____ is the additive identity for the whole numbers.
8. $(7 \times 8) \times 5 = 7 \times (8 \times 5)$ This statement shows that multiplication of whole numbers is _____.
9. How many numbers between 102 and 211.
10. $3 + 7 = 7 + 3$. This statement shows that addition of whole numbers is _____.
11. Determining the product by suitable rearrangements
    a) $2 \times 125 \times 50 \times 8$
    b) $16 \times 279 \times 625$
    c) $2 \times 1735 \times 50$
12. Using distribution property, find each of the following products.
    a) 213×104
    b) 256×1007
    c) 462×38
13. Find the value :
    a) $361 + 1482 + 639 + 518$
    b) $409 + 386 + 3591 + 614$
    c) $786 \times 97 + 786 \times 3$
    d) $14 + 438 + 486 + 62$
    e) $1252 \times 112 - 1252 \times 12$
    f) $716 \times 6 + 716 \times 4$
    g) $8062 \times 169 - 8062 \times 69$

14. A teacher purchases 42 Mathematics books and 42 English books for his class. If the cost of a Mathematics book is Rs 52 and the cost of an English book is Rs48. Find the total amount paid by the teacher to the shopkeeper.

15. If the cost of a pack of mango drink is Rs.14. Then how many packs of the drink can be purchased for Rs.76 and what is the balance ?

Knowing Our Numbers

1. Estimate using general rule :

   (i) 830 + 976 (ii) 496 − 215 (iii) 13,804 + 3,777 (iv) 61,292 −21, 496

2. Estimate the products using general rule :

   (i) 758 × 151 (ii) 4391 × 2300 (iii) 2187 × 456 (iv) 6978 × 43

3. Write the Roman Numeral for :

   (i) 99 (ii) 48 (iii) 67 (iv) 81 (v) 17 (vi) 76 (viii) 54

4. Answer the following :

1. The town newspaper is published every day. One copy has 15 pages. Everyday 12, 500 copies are printed. How man total pages are printed every day?
2. Apples are packed in boxes, each weighing 5kg 500gm. How many such boxes can be loaded in a van which cannot carry beyond 1000kg?

Whole Numbers

Answer : 1)100000 2)315 3) not defined 4) zero 5) one 6) odd 7) zero 8) associate 9) 108 10) commutative

11)a) 100000 b) 2790000 c) 173500

14) 24200 15) 5, Balance Rs.6

Knowing our numbers

Answers : I) (i) 1,800 (ii) 300 (iii) 18,000 (iv) 40,000

II) (i) 16,0000 (ii) 80,00,000 (iii) 10,00,000 (iv) 2,80,000

III) (i) XCIX (ii) XLVIII (iii) LXVII (iv) LXXXI (v) XVII (vi) LXXXI (v) XVII (vi) LXXVI (vii) XCIII (viii) LIV

IV) (1) 1,87,500 pages (2) 181 boxes

Understanding Elementary Shapes

I) Fill in the blanks :

1. An angle whose measure is greater than that of a right angle is _____
2. Three edges meet at a point called a _____.
3. A _____ is larger than a straight angles.
4. A Polygon with 5 sides is called a _____.
5. A triangle having all three unequal sides is called a _____.

II) Write down the measure of

a) Some acute angles.

b) Some obtuse angles.

c) What is the measure of a straight angle?

III) What shape is

a) A brick.

b) A match box

c) A sweet laddu

d) A ball

e) A die

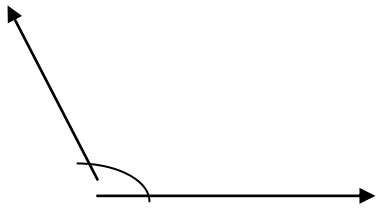
f) A road roller

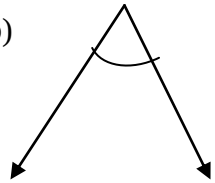
IV) Name the types of following triangles :

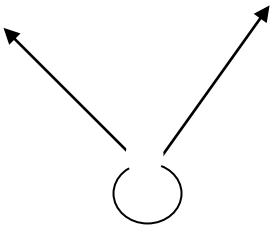
1. ΔLMN with $m < L = 80^0$, $m < M = 70^0$, $m < M = 30^0$.
2. ΔABC with $m < A = 90^0$.
3. ΔPQR such that $PQ = QR = PR = 8cm$
4. ΔXYZ with $AB = 8cm$ $BC = 5cm$ $CA = 5cm$
5. Triangle with lengths of sides 7cm, 8cm and 9cm.
6. ΔPQR with $m < Q = 90^0$ and PQ=QR.

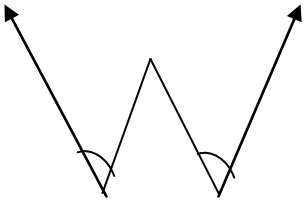
V) Let $\overline{PQ}$ be the perpendicular to the line segment $\overline{XY}$. Let $\overline{PQ}$ and $\overline{XY}$ intersect in the point A. What is the measure of $< PAY$?

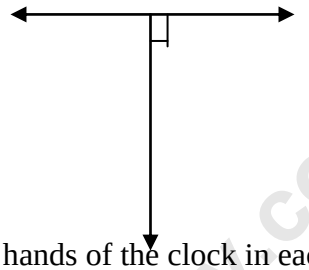
VI) Classify each one of the following angles as right ,straight , acute , obtuse or reflex.

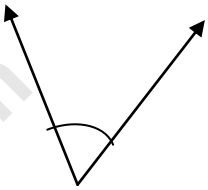
a) 

b) 

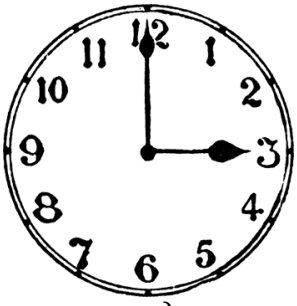
c) 

d) 

e) 

d) 

VII) Find the angle measure between the hands of the clock in each figure

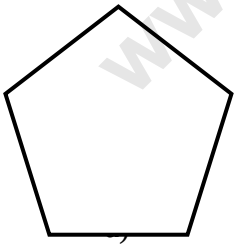


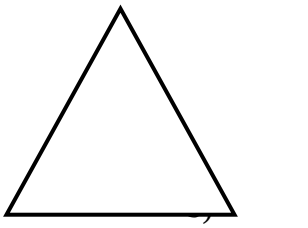
a)

b)

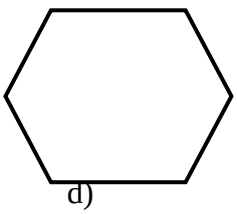
c)

VIII) Name each polygon

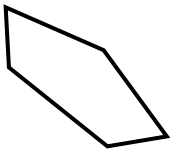




c)



d)



e)

IX) 1. A cuboid has _____ faces.

2. Each face has _____ edges.

3. Each face has _____ vertices.

Answers :

I) 1. Obtuse angle 2. Vertex 3. Reflex angle

4. Pentagon 5. Scalene triangle 6. 90^0

III) a) cuboid b) cuboid c) sphere d) sphere e) cube f) cylinder

IV) 1. Acute angled triangle 2. Right angles triangle

3. Equilateral triangle. 4. Isosceles triangle.

5. Scalene triangle 6. Isosceles right angled triangle

VI) a) obtuse angle b) Acute angle c) Reflex d) Acute

e) Right f) Acute

VII) a) Right angle 90^0 b) Acute c) Straight angle 180^0

VIII) a) Pentagon b) triangle c) Quadrilateral d)octagon e) Pentagon

IX 1. 6 faces 2. 4 edges 3. 4 edges

Playing With Numbers]

Fill in the blanks:

1. _____ is a factor of every number.
2. The factor of a prime number is _____ and _____.
3. A number which has more than two factor is called _____.
4. The smallest perfect number is _____.
5. If a number ends with 0, it is divisible by _____.
6. The sum of all the factors of a perfect number is equal to _____ the number.
7. _____ is neither prime nor composite.
8. A number is divisible by 6, if it is divisible by both _____ and _____.
9. The smallest even numbers is _____ and the smallest odd numbers is a _____.
10. Sum of any two even numbers is _____.
11. Sum of two odd numbers is _____.
12. The only one even prime is _____.
13. The greatest two digit prime number is _____.
14. The smallest two digit prime numbers is _____.
15. The difference between two twin prime is _____.
16. A prime number has only _____ factors.
17. _____ is the unique number.
18. The smallest digit in the blank space of _____9853. So that the number so formed is divisible by 3.
19. The L.C.M of two numbers in which one is a factor of the other is _____.
20. The L.C.M of two co-prime numbers _____.
21. The smallest factor of 856 is _____.
22. The smallest multiple of 856 is _____.

23. The greatest factor of 856 is _____.

24. The perfect numbers below 100 are _____ and _____.

25. The smallest prime number is _____.

26. The smallest composite number is _____.

27. The smallest number having three different prime factors is _____.

28. The sum of any two consecutive odd numbers is always divisible by _____.

29. The product of three consecutive numbers is divisible by _____.

Do the following :

1. Express the smallest 5 – digit number in the form of prime factor.
2. Determine if 9130 is divisible by 110.
3. Using divisibility test check whether the following are divisible by
   2, 3, 4, 5, 6, 8, 9, 10 and 11
   (a) 91800 (b) 31956 (c) 81615 (d) 61042 (e)48400
   (f) 99909

4. Write all the twin primes below 100.

5. Write all the prime numbers below 70.

6. Find the smallest number when divided by 28, 40 and 44 leave a remainder 8 in each case.

7. Write two prime numbers whose sum is 100.

8. Write three pairs of prime numbers whose sum is an odd number.

9. Find the smallest four digit number which is exactly divisible by 12, 16, 24 and 36.

10. Write all the composite numbers between 30 and 50.

11. The length , breadth and height of a room are 8m25cm, 6m75cm and 4m50cm respectively. Determine the longest tape which can measure the three dimension of the room exactly.

12. Telegraph pole occurs at equal distances of 220m along a road and heaps of stones are put at equal distances of 300m along the same road. The first heap is at the foot of the first pole. How far from it along the road is the next heap which lies at the foot of a pole.

Answers :

1) 1 2) 1 and number itself 3) composite 4) 6 5) 10, 2 and 5

6) twice 7) 1 8) 2 & 3 9) 2, 1 10) even 11)even 12) 2

13) 97 14)11 15) 2 16) two 17) 1 18) 2

19) the greater number 20) their product 21) 856 22) 856

23) 6 and 28 24) 2 25) 4 26) 30 27) 4

28) 6

Do the following

1. $2\times 2\times 2\times 2\times 2\times 5\times 5\times 5\times 5\times 5$
2. Hint : Check the divisibility of 11 and 10.

4. (3, 5), (5,7) , (11,13) , (17, 19) , (29,31), (41, 43) …….

5. 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.
6. Hint : Find the LCM add 8.
7. 97 + 3 = 100, 89 + 11 = 100
8. (2,7), (2,11), (2,13)…….
9. 864

11. 75cm

12. 3300

Basic Geometrical Ideas]

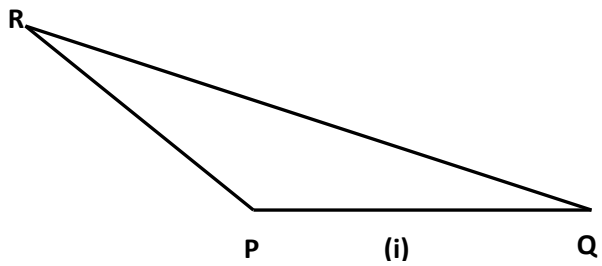
I) (a) Name all the different angles shown in the figures :

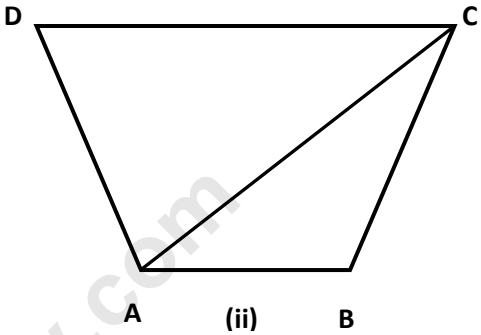
(b) Count the number of angles.

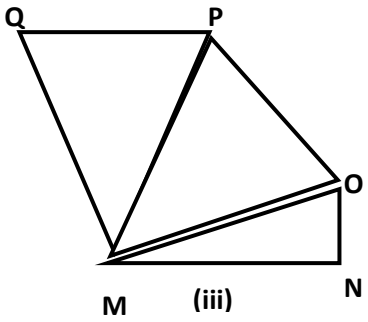
(c)List the acute angles

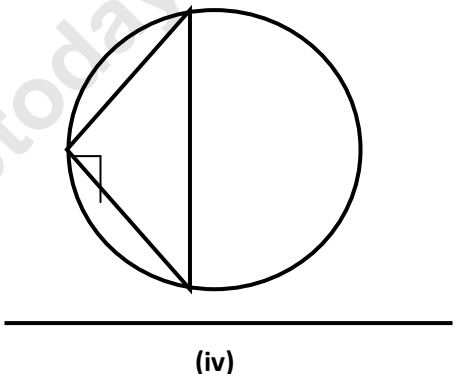
(d) List the obtuse angles

(e) Identify the right angles and straight angles.

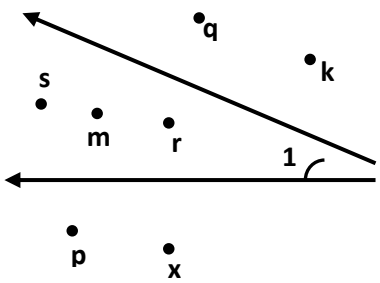


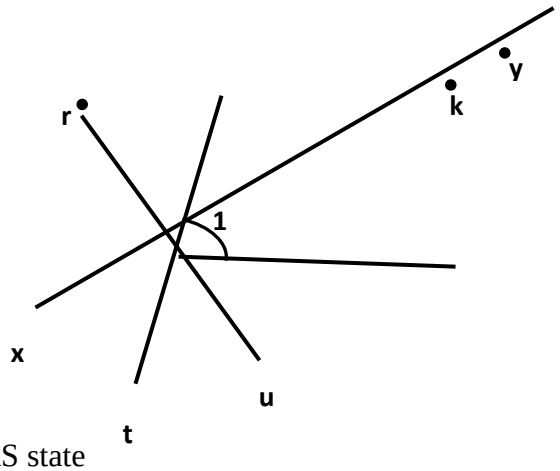






2) List all the points which are in the exterior and interior of the given angle $\angle 1$





3. Draw a rough sketch of a quadrilateral PQRS state

a) two pairs of opposite sides.

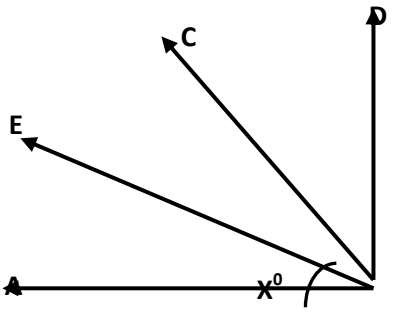
b) two pairs of opposite angles.

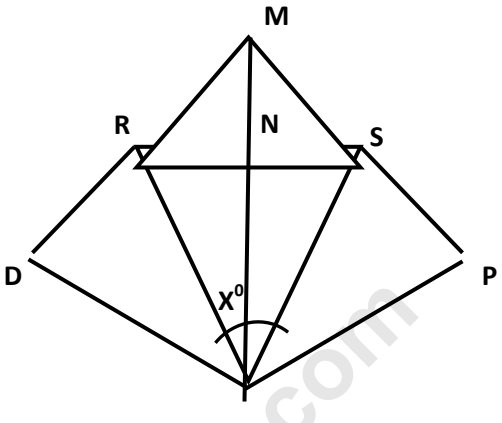
c) four pairs of adjacent angles

d)four pairs of adjacent sides.

e) Draw the diagonals and name them.

4) Name the interior and exterior points of the angle marked x^0 in the following:

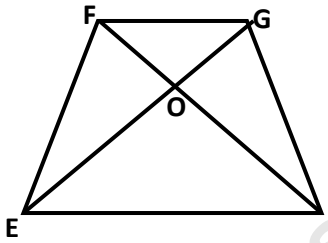


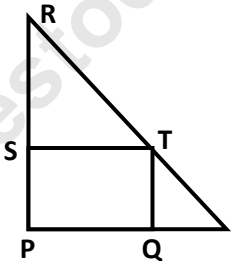


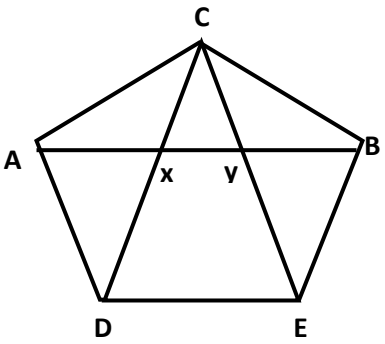
5) a) Identify the triangles in the figure :

b) Write the names of angles

c) Write the names of line segments.







6) Draw any circle and mark

(a) its centre

(b) three radii

(c) a diameter

(d) shade a minor sector

(e) colour a minor arc

(f) a chord

(g) two points in its interior

(h) two points in its exterior

(j) three points on the circle

Integers

I Fill in the blanks:

1. -5 + (-11) = _____

2. 8 + (-6) = _____

3. (-26) + (-37) = _____

4. Write the greatest negative integer _____

5. Write all integers between - 30 and -20 _____

6. Find the sum of - 45 and 30

7. Which is greater : -65 or -56 ?

8. Which integer is neither positive nor negative ?

II. Draw a number line and answer the following :

1. Which number will we reach if we move 4 numbers to the right of -2 ?

2. If we are at -6 on the number line, in which direction should we move to reach -1 ?

3. Using the number line write the integer

   a) 4 less than -1 2) 6 more than -6

4. Use number line and add the following integers :

a) (-1) + (-8) b) (-1) + (-2) + (-4) c) -8 - (-10)

5. Fill in the blanks with >, < or =

a) 54 - (-11) _____ 57 + (-4)

b) (-35) - (-52) _____ (-52) - (-35)

6. Find :

i) 60 - (-20) - (+10) ii) (-15) + 12 - 9 +1

Fractions

1. What fraction of an hour is 30 minutes ?

2. Write the natural numbers from 5 to 15. What fraction of them are prime numbers?

3. Express as mixed fractions. a) $\frac{30}{7}$ b) $\frac{51}{9}$

4. Express as improper fractions. a) $7\frac{3}{9}$ b) $11\frac{1}{13}$

5. Find as equivalent fraction of $\frac{56}{72}$ with denominator 18.

6. Simplify

i) $\frac{21}{35}$ ii) $\frac{34}{85}$ iii) $\frac{75}{120}$ iv) $\frac{66}{75}$ v) $\frac{112}{128}$ vi) $\frac{48}{57}$

7. Add

a) $\frac{5}{12}$ and $\frac{19}{24}$ b) $\frac{3}{8}$, $\frac{1}{2}$, and $\frac{5}{6}$ c) $2\frac{5}{6}$ and $8\frac{1}{4}$

8. The weight of two boxes together is $5\frac{3}{4}$ kg. If one box weighs $2\frac{5}{6}$ kg,

Find the weight of the other.

Mensuration

1. The length and breadth of a Rectangle are 11 cm and 9 cm. Find its area and Perimeter.

2. The area of a Rectangle is 144 sq cm and its length is 16 cm. Find the breadth of the Rectangle?

3. Find the perimeter of a regular hexagon of side x cm.

4. If the perimeter of a regular pentagon is 65 cm. Find its side ?

5. The perimeter of a triangle is 42 cm. If two of its sides are 16 cm and 12 cm. Find its third side?

6. A piece of string is 45 cm long. It is bent to form an equilateral triangle. Find the side of triangle.

7. An athlete takes 5 rounds of a rectangular park 120 m long and 80m wide. Find the total distance covered by him.

8. Find the area of a square whose perimeter is 260 cm.

9. The total cost of fencing a square park at Rs. 20 per metre is Rs. 2880. Find the side of the square park.

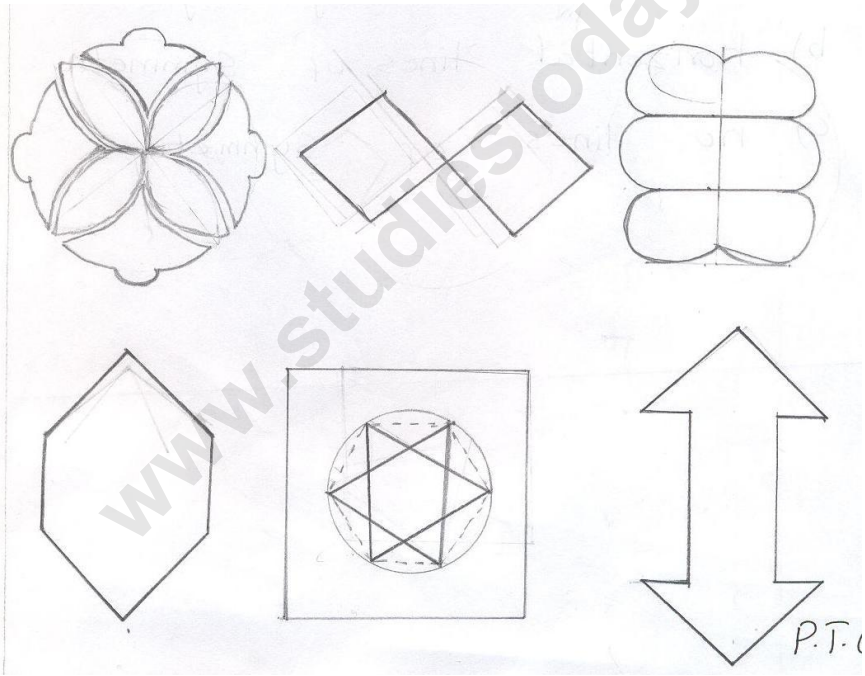
10. The floor of a room with dimensions 5 m and 3m is to be covered with square tiles. If each square tile is of side 25 cm. Find the number of tiles required.

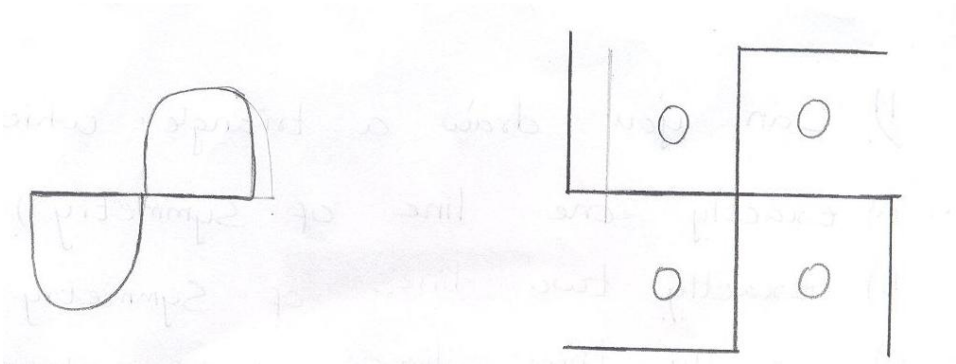
Practical Geometry

1. Draw a circle of radius 5.6cm
2. With the same centre O, draw two circles of radii 5cm and 2.5cm
3. Draw any circle and mark points P, Q and R such that
   a) P is on the circle
   b) Q is in the interior of the circle.
   c) R is in the exterior of the circle.
4. Draw any line segment $\overline{PQ}$. Mark any point B on it. Through B, draw a perpendicular to $\overline{PQ}$.
5. Draw $\overline{XY}$ of length 8.3cm and find its axis of symmetry.
6. Draw a line segment of length 10.5cm and construct its perpendicular bisector.
7. With $\overline{AB}$ of length 6.2cm as diameter, draw a circle.
8. Draw a circle of radius 4.5cm. Draw any two of its chords. Construct the perpendicular bisectors of these chords. Where do they meet.
9. Draw a line segment of length 10.8cm. Using compasses, divide it into four equal parts . Verify by actual measurement.
10. Draw the perpendicular bisector of $\overline{AB}$ whose length is 8.3cm
    a) Take any point P on the bisector drawn. Examine whether PA = PB
    b) If M is the mid point of $\overline{AB}$, what can you say about the length of MA and MB?
11. Draw an angle of measure 137^0 and construct its bisector.
12. Draw a right angle and construct its bisector.
13. Draw an angle of measure 152^0 and divide into four equal parts
14. Draw an angle of measure 60^0 and bisect it.
15. Draw an angle of measure 150^0 and bisect it.
16. Construct with ruler and compasses, angles of following measures.
    a) 60^0
    b) 120^0
    c) 90^0
    d) 45^0
    e) 15^0
    f) 30^0

17. Draw a circle and any two of its diameter. What is the figure obtained ? What figure is obtained if the diameter are perpendicular to each other ?

1) Can you draw a triangle which has
   a) exactly one line of symmetry
   b) exactly two lines of symmetry ?
   c) exactly three lines of symmetry ?
   d) no lines of symmetry ?
2) Find the number of lines of symmetry in each of the following shapes ?





3) Consider the letters of English alphabets, A to Z.

List among them the letters which have

a) Vertical lines of symmetry

b) Horizontal lines of symmetry

c) No lines of symmetry

4) Complete the following table :

Sl#	Shape	Rough Figure	Number of lines of symmetry
1.	Equilateral triangle		
2.	Square		
3.	Rectangle		
4.	Isosceles Triangle		
5.	Rhombus		
6.	Circles		
7.	Parallelogram		
8.	Scalene Triangle		

5) Write some application of symmetry in everyday life.