NEW ERA PUBLIC SCHOOL

Solved Assignment for Unit 2

Class: 8th Subject: MATHS

SYLLABUS:

Chapter 1: Understanding Quadrilaterals

Chapter 2: Practical Geometry

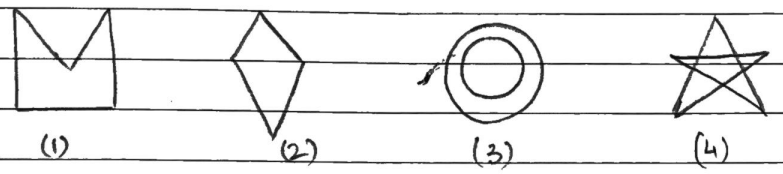
Chapter 3: Data Handling

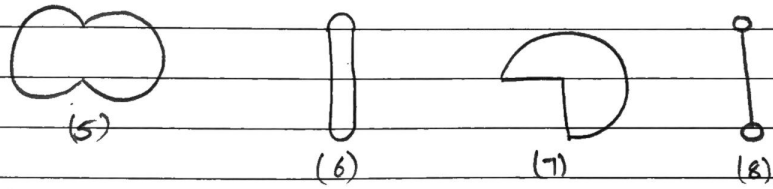
Chapter 1: Understanding Quadrilaterals

1. Polygons: A polygon is a closed curve made up of line segments. The line segments are the sides of polygon.
2. Diagonals: A diagonal is a line segment connecting two non consecutive vertices of a polygon
3. **Quadrilateral**: A four sided bounded fig. is called Quadrilateral

EXERCISE 3.1

Q1: Given below are some figures





Sol: Simple curved: 1, 2, 5, 6, 7

Simple closed curved: 1, 2, 5, 6, 7

Polygon: 1, 2, 4

Convex Polygon: 2

Concave Polygon: 1, 4

Q2: How many diagonals does each of the following have?

Sol: 1. Convex Quadilateral has 2 diagonals
2. A Regular Hexagon has 9 diagonals
3. A triangle has no diagonal.

Q3: (a) Sum of measure of a convex quadilateral is 360°.
(b) Yes, this property holds if quadilateral is not convex.

Q4: What can you say about the angle sum of convex polygon with no. of sides?
a) 7 b) 8 c) 10 d) n

Sol: (a) Sum of angles of a convex polygon with 7 sides is given by
$(n-2) \times 180$
$= (7-2) \times 180° = 5 \times 180° = 900°$

(b) Sum of angles of a convex polygon with 8 sides
$(8-2) \times 180° = 6 \times 180 = 1080°$

(c) Sum of angles of a convex polygon with 10 sides
$(10-2) \times 180° = 8 \times 180 = 1440°$

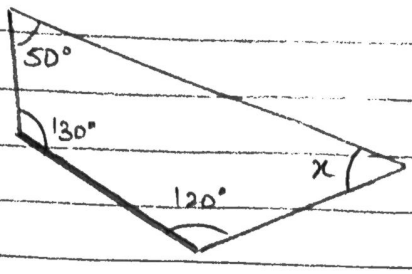
(d) Sum of angles of a convex polygon with n sides
$(n-2) \times 180°$

Q5: What is a regular polygon?

Sol: A regular polygon is both equiangular and equilateral.
(i) A regular polygon having 3 sides is called equilateral triangle
(ii) A regular polygon having 4 sides is called a square.
(iii) A regular polygon having 6 sides is called hexagon

Q6: Find the angle measure x in the following figures.

a)

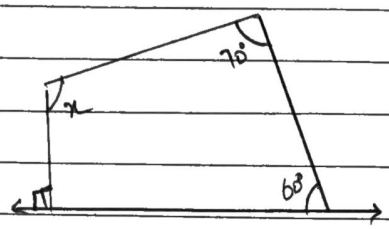


Sol: $50^\circ + 130^\circ + 120^\circ + x = 360^\circ$

$300^\circ + x = 360^\circ$

$x = 360^\circ - 300^\circ = 60^\circ$

b)



$90^\circ + 60^\circ + 70^\circ + x = 360^\circ$

$220 + x = 360^\circ$

$x = 360 - 220 = 140^\circ$

c)

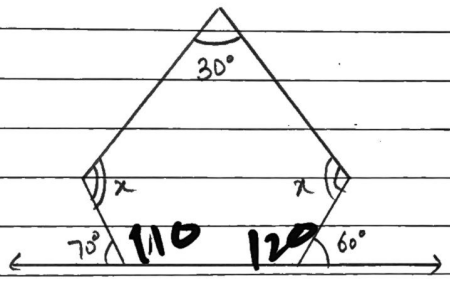


Fig. (c) has 5 sides

∴ its angle sum $= (5-2) \times 180^\circ = 3 \times 180 = 540^\circ$

Also, exterior angles 70° & 60° are given

∴ Corresponding interior angles $(180 - 70 = 110^\circ)$ & $(180 - 60 = 120^\circ)$ respectively

$\therefore 110^\circ + 120^\circ + x + 30^\circ + x = 540^\circ$

$260^\circ + 2x = 540^\circ$

$2x = 540 - 260 = 280^\circ$

$x = \frac{280}{2} = 140^\circ$

d)

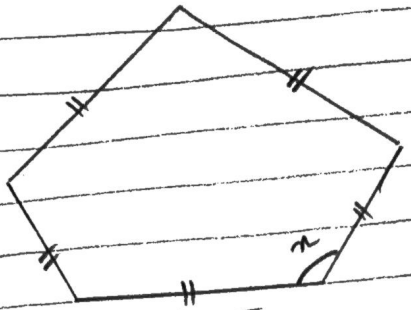


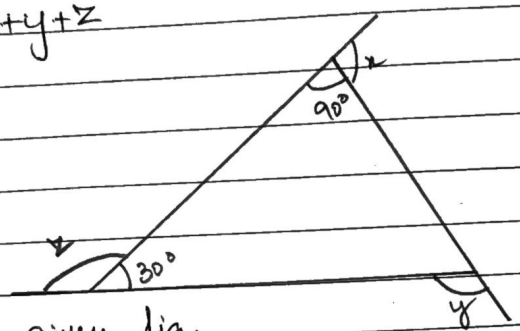
Fig. (d) is a regular pentagon

$\therefore$ its angle sum $= (5-2) \times 180^\circ = 3 \times 180^\circ = 540^\circ$

$\therefore x + x + x + x + x = 540^\circ$

$5x = 540 \Rightarrow x = \frac{540}{5} = 108^\circ$

Q7: a) Find $x+y+z$



Sol: In the given fig.

a) Exterior angle $x = (180-90) = 90^\circ$

Exterior angle $z = (180-30) = 150^\circ$

$\because$ Sum of interior angles of a Triangle is 180°

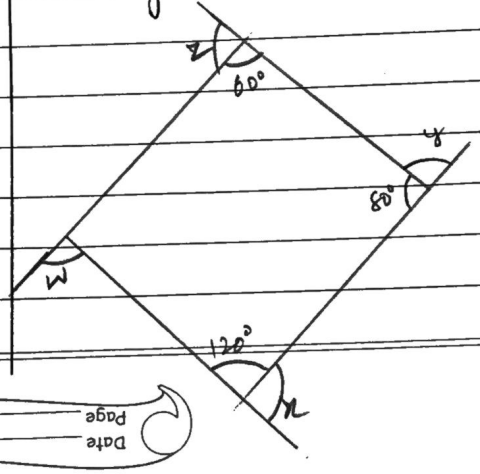
$\therefore 90 + 30 + p = 180$

$120 + p = 180^\circ \Rightarrow p = 180 - 120 = 60^\circ$

$\therefore$ Exterior angle $y = (180-60) = 120^\circ$

$\therefore x + y + z = 90 + 150 + 120 = 360^\circ$

b)



In the given fig (b):

Exterior angle $x = 180 - 120 = 60^\circ$

Exterior angle $y = 180 - 80 = 100^\circ$

Exterior angle $z = 180 - 60 = 120^\circ$

$\because$ Sum of interior angles of quad is 360°

$\therefore 120^\circ + 80^\circ + 60^\circ + q = 360^\circ$

$\therefore 260 + q = 360 \Rightarrow q = 360 - 260 = 100$

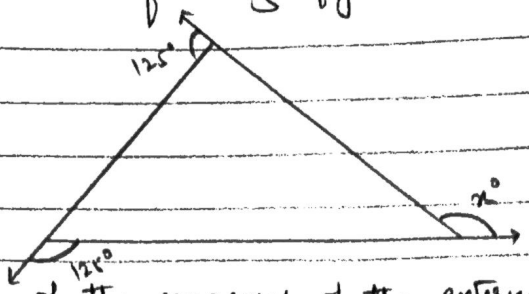
$\therefore$ Exterior angle $w = 180 - 100 = 80^\circ$

$\therefore x + y + z + w = 60 + 100 + 120 + 80 = 360^\circ$

Exercise 3.2

Q1: Find x in the following fig.

(a)

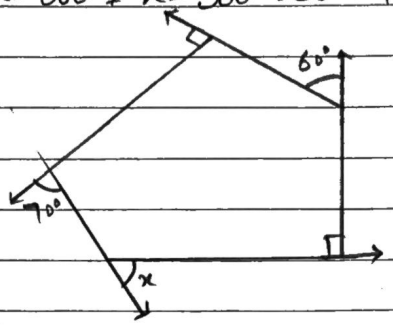


Sol: As the sum of the measures of the external angle of any polygon is 360°

$\therefore 125 + 125 + x = 360$

$250 + x = 360 \Rightarrow x = 360 - 250 = 110°$

(b)



As the sum of measures of the external angles of any polygon is 360°

$\therefore x + 90 + 60 + 70 = 360°$

$= x + 310 = 360 \Rightarrow x = 360 - 310 \Rightarrow x = 50°$

Q2: Find the measure of each exterior angle of regular polygon of
i) 9 sides ii) 15 sides.

i) The polygon being regular having 9 sides.

$\therefore$ All the exterior angles have equal measure, say x

$\therefore 9x = 360°$

$\therefore x = 360/9 = 40°$

$\therefore$ Measure of each exterior angle $= 40°$

ii) The polygon being regular having 15 sides

$\therefore$ All the exterior angles have equal measure, say x

$\therefore 15x = 360°$

$x = \frac{360}{15} = 24°$

$\therefore$ Measure of each exterior angle $= 24°$

Q3: Total measure of all exterior angles = 360°

Sol: Measure of each exterior angle = 24°

∴ No. of exterior angles = $\frac{360}{24^\circ} = 15$

∴ The polygon has 15 sides.

Q4: Measure of each interior angle = 165°

Sol: ∴ Measure of each exterior angle = 180 − 165 = 15°

Total measure of all exterior angles = 360°

∴ No. of sides = $\frac{360}{15} = 24$

∴ Polygon has 24 sides.

Q5 (a) No, since 22 is not a divisor of 360°

Sol:

(b) No because each exterior angle is (180 − 22) = 158°, which is not a divisor of 360°.

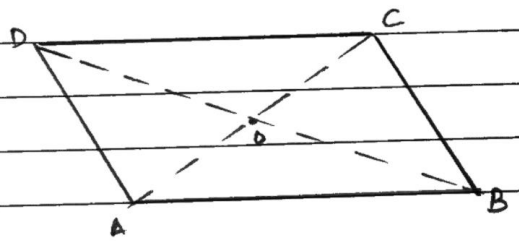
Q6: The equilateral Triangle being a regular polygon

Sol: (a) of 3 sides has the least measure of an interior angle is equal to 60°.

(b) The greatest exterior angle of an equilateral triangle can be (180 − 60) = 120°.

EXERCISE 3.3

Q1:



Sol (i) AD = BC

∵ in a parallelogram opposite sides are equal.

(ii) $\angle DCB = \angle DAB$

∵ in a parallelogram opposite angles are equal.

(iii) $OC = OA$

∵ in a parallelogram diagonals bisect each other.

(iv) $m\angle DAB + m\angle CDA = 180°$

∵ any two adjacent angles of a parallelogram are supplementary.

Q3:

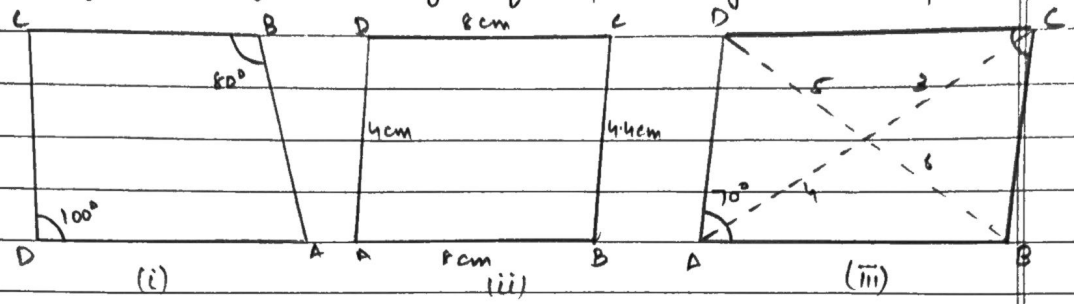
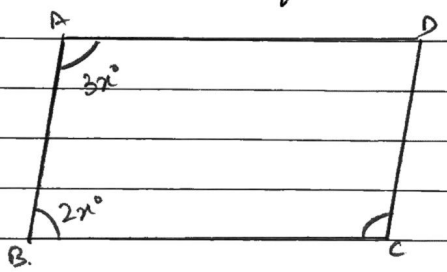


Fig (i) is not a parallelogram, because opposite angles i.e $\angle C$ & $\angle A$ are not equal.

Fig (ii) is not a parallelogram, because, the opposite sides i.e AB & CD and BC & DA are not equal.

Fig (iii) is also not a parallelogram b'coz, the diagonals of a parallelogram bisect each other & hence it is not so, and $\angle A$ & $\angle C$ are not equal..

Q5:



Let ABCD be a given llgm.

Then, $\angle A$ & $\angle B$ are its adjacent angles.

Let $\angle A = 3x°$ & $\angle B = 2x°$, Then

$\angle A + \angle B = 180°$

$3x + 2x = 180° \Rightarrow 5x = 180° \Rightarrow x = 36°$

$\therefore \angle A = 3x = 3 \times 36° = 108°$

and $\angle B = 2x = 2 \times 36 = 72°$ [∵ $\angle B$ & $\angle C$ are adjacent angles]

$\Rightarrow 72 + \angle C = 180°$

$\angle C = 180 - 72 = 108°$

Also, $\angle C + \angle D = 180°$ [$\because \angle C$ & $\angle D$ are adjacent angles.]

$\Rightarrow 108 + \angle D = 180$

$\Rightarrow \angle D = 180 - 108 = 72°$

$\therefore \angle A = 108°$; $\angle B = 72°$; $\angle C = 108°$; $\angle D = 72°$.

Q6: It is given that, ABCD is a llgm in which two adjacent angles $\angle A$ & $\angle B$ have equal measure, say x.

Sol: $\therefore m\angle A = x°$ & $m\angle B = x°$

As sum of any two adjacent angles of a llgm is 180°

$\therefore \angle A + \angle B = 180°$

$x + x = 180°$

$\Rightarrow 2x = 180° \Rightarrow x = 90°$

Also, opposite angles of a llgm are equal.

$\therefore \angle A = \angle C$

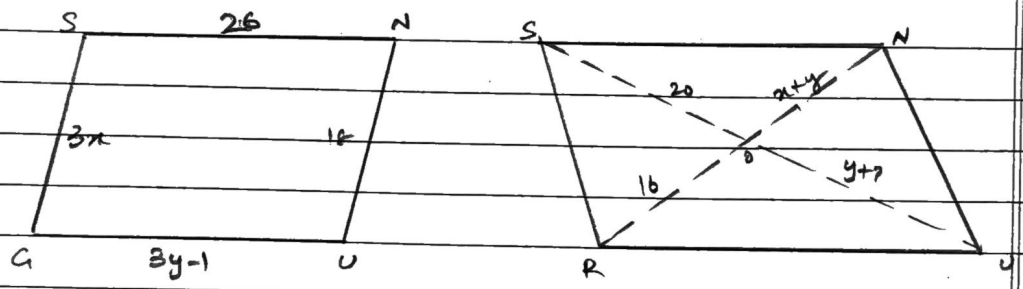
i.e $x = y = 90°$

$\angle B = \angle D$

$\Rightarrow x = z = 90°$.

Q8:

Sol:



(i) It is given that GUNS is llgm

$\therefore$ opposite sides of a llgm are parallel and equal.

i.e $GU = NS$ & $NU = SG$

$\therefore 3y - 1 = 26$ & $18 = 3x$

$\Rightarrow 3y = 26 + 1$ & $x = 18/3 = 6$

$3y = 27 \Rightarrow y = 9$

$y = 9$; $x = 6$

(ii) RUNS is a ||gm

∴ diagonals of a ||gm bisect each other

∴ OU = OS

$\Rightarrow y+7 = 20$

$y = 20-7 = 13$

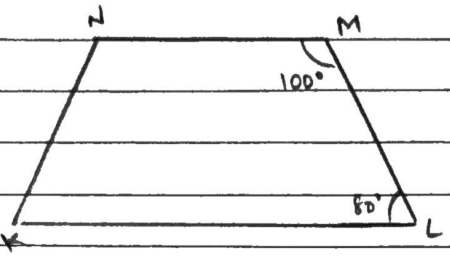
Also, NO = OR

$x+y = 16$

$x+13 = 16 \Rightarrow x = 16-13$

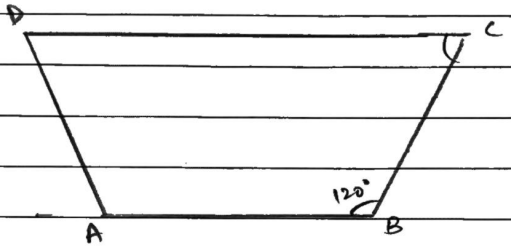
$x = 3$

Q10:



Sol: The given fig. KLMN is a trapezium, as two sides KL & MN are parallel, b'coz. sum of its adjacent angles ∠L & ∠M is 180°

Q11:



It is given that ABCD is a trapezium having $\angle B = 120^\circ$ and two of its sides AB & CD are parallel

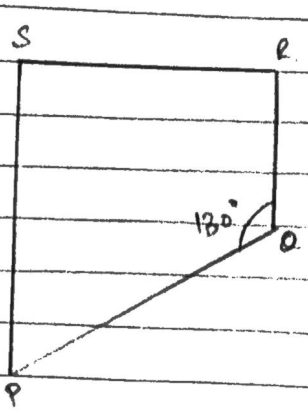
$\therefore \angle B + \angle C = 180^\circ$

$\Rightarrow 120 + \angle C = 180^\circ$

$\Rightarrow \angle C = 180^\circ - 120^\circ = 60^\circ$.

Q12:

Sol:



It is given that, PQRS is a trapezium having $\angle Q = 130°$ and two of its sides PS & RQ are parallel.

$\therefore \angle P + \angle Q = 180°$

$\Rightarrow \angle P + 130° = 180°$

$\Rightarrow \angle P = 50°$

Also, $\angle R$ & $\angle S$ each have measure 90° i.e sum of all the interior angles of a quad. is 360°

$\therefore \angle P + \angle Q + \angle R + \angle S = 360°$

$\angle P + 130 + 90 + 90 = 360°$

$\angle P + 310° = 360°$

$\angle P = 360 - 310°$

$\Rightarrow \angle P = 50°.$

EXERCISE 3.4

Q1 Sol:) a) False (c) True (e) False (g) True
b) True (d) False (f) True (h) True

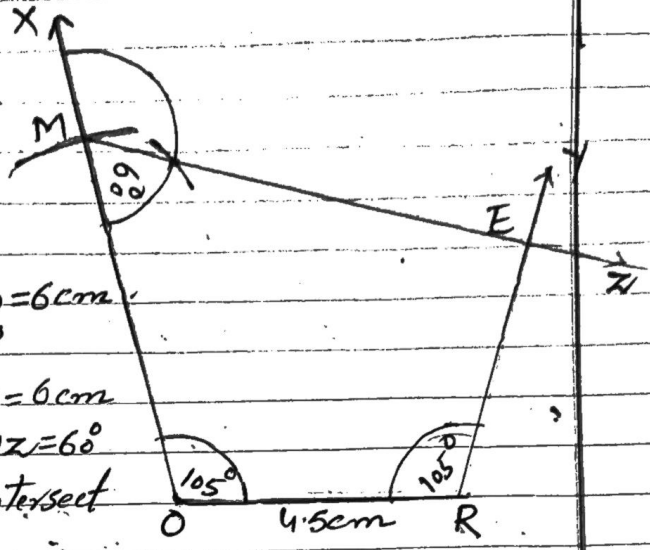
Q2: a) Square & Rhombus.
Sol: b) Square & Rectangle

Q3 Sol:
(i) Any four sided fig. is called a quad. & so is the Square.
(ii) Opposite sides of a llgm are equal & parallel & is the Square.
(iii) All the four sides of a rhombus are equal & so is the Square.
(iv) All the four angles of a rectangle are right angles and opposite sides are equal, same is the case with the Square.

Unit → 2nd Pratical Geometry

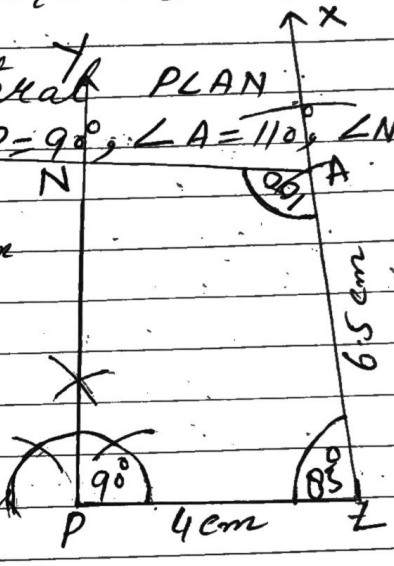
Exercise 4.1 and 4.2 already done in class
Exercise 4.3. A quad. Can be constructed uniquely if its two adj. sides and three angles are known.

Q1 Construct
The quad. MORE
MO = 6cm, OR = 4.5cm
∠M = 60°, ∠O = 105°
∠R = 105°



Sol:→ Steps of Construction
1. Draw a line segment MO = 6cm.
2. At O draw ∠XOR = 105°
3. From ray OX, cut OM = 6cm
4. At R draw an ∠OMZ = 60°
The RY and MZ intersect each other at E
Hence MORE is a required quadrilateral

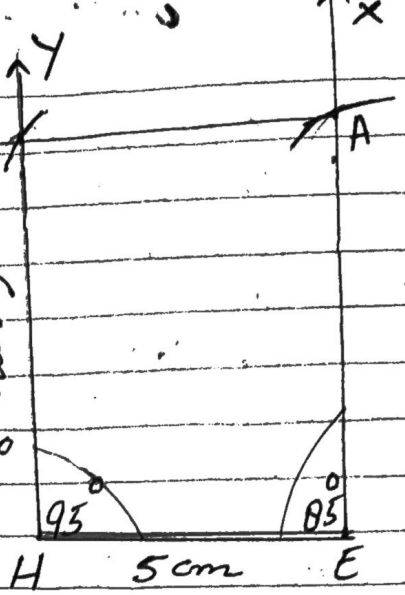
Q2. Construct a quadrilateral PLAN
PL = 4cm, LA = 6.5cm, ∠P = 90°, ∠A = 110°, ∠N = 85°



Sol:- Steps of Construction
1. Draw a line segment PL = 4cm
2. At P draw an ∠LPY = 90°
3. At L draw an ∠PLX = 85°
4. Cut off LA = 6.5cm in LX
5. At A draw an ∠LAZ = 100°
6. PY and AZ intersect each other at N.
Thus PLAN is required quad.

Q3:→ Construct a parallelogram HEAR
HE = 5cm, EA = 6.5cm, ∠R = 85°
In a ||gm opposite sides are equal and opposite angles are equal.

(2) Steps of Construction

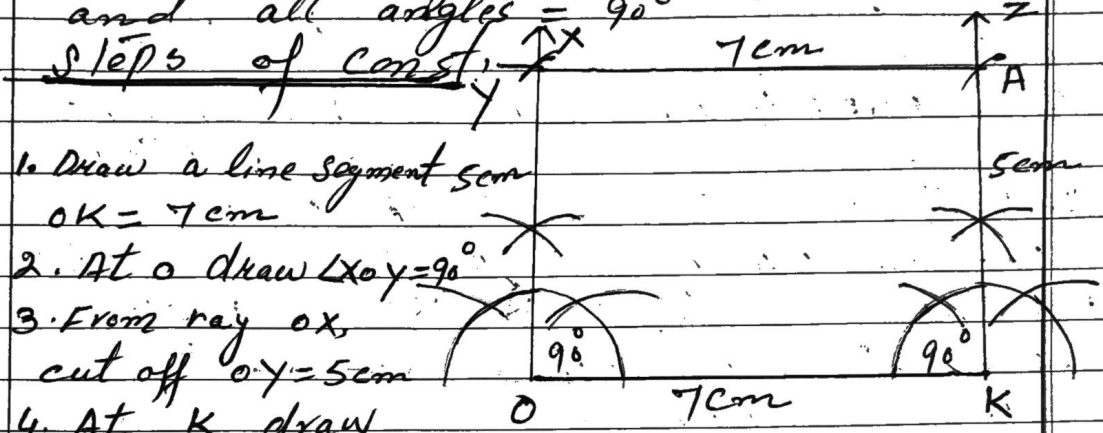


1. Draw line segment HE = 5cm
2. At E draw ∠HEA = 85° and cut off EA = 6cm in EX
3. Here ∠H = (180 − 85°) = 95°
4. Draw ∠EHY = 95° and cut off HR = 6cm
5. Join HR and RA

Thus HEAR is the required Parallelogram.

Q4. In a rectangle opposite sides are equal and all angles = 90°

Steps of const.



1. Draw a line segment 5cm OK = 7cm
2. At O draw ∠XOY = 90°
3. From ray OX, cut off OY = 5cm
4. At K draw an angle ∠OKZ = 90°
5. From ray KZ cut off KA = 5cm.
6. Join AY

Hence OKAY is a required rectangle.

Exercise 4.4. When three sides and two included angles are given.

Q1. Construct a quad. DEAR

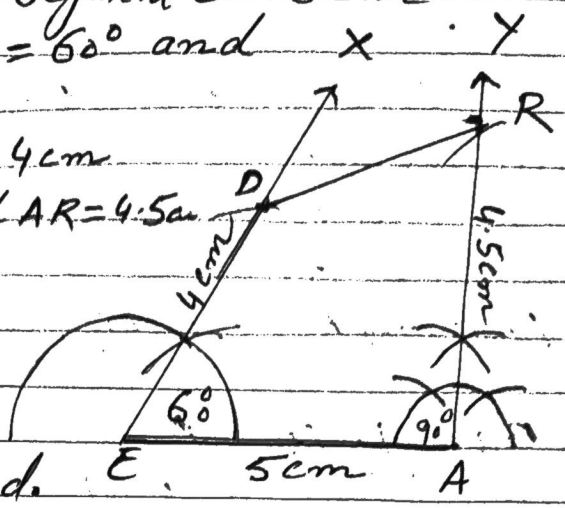
DE = 4cm, EA = 5cm, AR = 4.5cm, ∠E = 60°, ∠A = 90°

Steps of Construction

Q1. Steps of Construction:→

1. Draw line segment EA = 5 cm
2. Draw an ∠XEA = 60° and ∠EAY = 90°
3. Cut off ED = 4 cm from EX and AR = 4.5 cm from AY
4. Join DR.

Hence DEAR is the required quad.



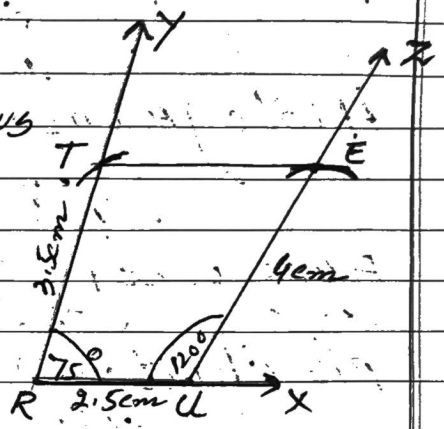
Q2. Const a quad. TRUE

TR = 3.5 cm, RU = 3 cm, UE = 4 cm, ∠R = 75°, ∠U = 120°

Steps of Construction:

1. Draw ∠YRX = 75°
2. With centre R and radius 3.5 cm draw an arc to intersect RY in T.
3. With centre R and radius 2.5 cm draw an arc to intersect RX in U.
4. Draw ∠RUZ = 120°
5. With centre U and radius 4 cm draw an arc to intersect UZ in E.
6. Join TE

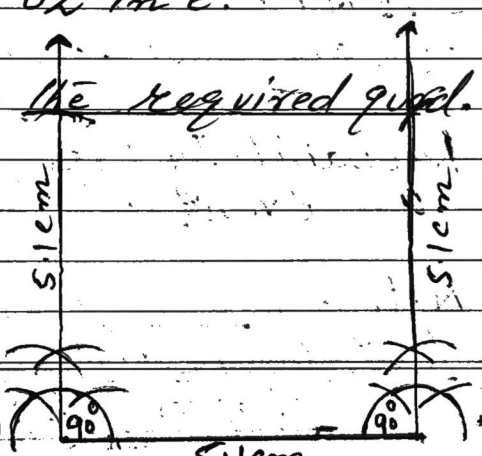
Hence TRUE is the required quad.



EXERCISE-4.5

Draw the square READ with RE = 5.1 cm

Q1 In a square all angles are equal = 90° all the sides are equal.



(4)

Q2. Same as Exercise 4.2 Question no 2. Q3 and Q4 Practice yourself.

Chapter :→ DATA HANDLING

Introduction :→

Data mostly available to us in an unorganised form is called raw data.

A Pictograph represent data using pictures

A Bar graph A display of information using bars of uniform with their heights being proportional to the respective values is called a bar graph.

Double Bar graph. A bar graph showing two sets of data simultaneously is called a double bar graph.

Histogram :→ Grouped data can be represented using histogram. There is no gap between the class interval.

Frequency gives the number of times that a particular entry occurs

PIE Chart :→ A circle graph shows the relationship between a whole and its part. Data can also presented using circle graph.

EVENT :→ one or more outcomes of an experiment make an event

Probability of an event :→ $\frac{\text{no of outcomes that make an event}}{\text{Total number of outcomes of the experiment}}$

Note :→ For questions refer to your text book and go through the Chapter thoroughly.

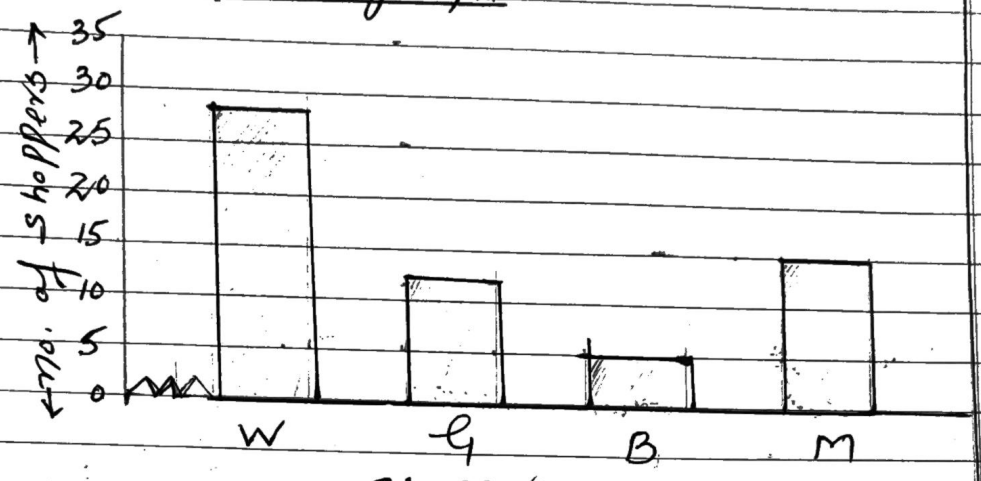
Exercise 5.1

Q2. Frequency distribution table

Sol:→

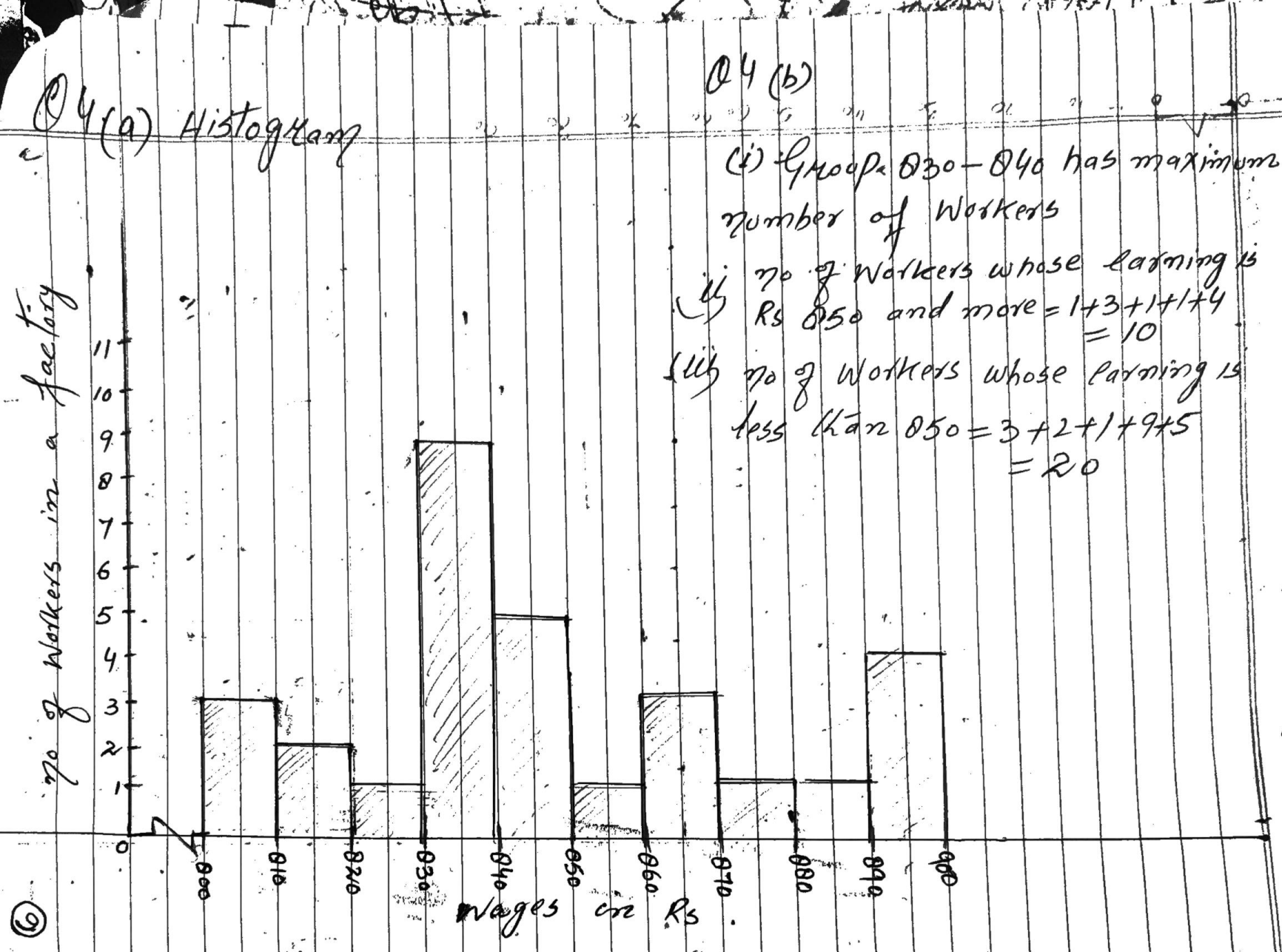
Shoppers	Tally Marks	No. of Shoppers
W	𝍸 𝍸 𝍸	
	𝍸 𝍸 111	28
G	𝍸 𝍸 11	12
B	𝍸	5
M	𝍸 𝍸 𝍸	15
Total		60

Q2 Bar graph



Frequency Table		
Class interval Wages in Rs	Tally mark	Frequency
800 – 810	111	3
810 – 820	11	2
820 – 830	1	1
830 – 840	𝍸 1111	9
840 – 850	𝍸	5
850 – 860	1	1
860 – 870	111	3
870 – 880	1	1
880 – 890	1	1
890 – 900	1111	4
Total		30

Q4(a) Histogram



Q4 (b)

(i) Group 030–040 has maximum number of Workers

(ii) no of Workers whose earning is Rs 050 and more = 1+3+1+1+4
= 10

(iii) no of Workers whose earning is less than 050 = 3+2+1+9+5
= 20

Q5 From the given bar Graph we see.

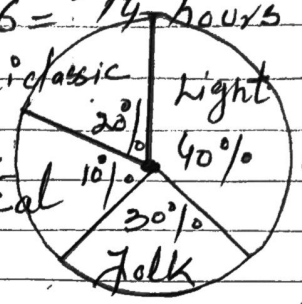
- (i) Maximum number of students watched TV = 4 to 5 hours.

(ii) no of students watched T.V less than 4 hours = 4 + 8 + 22 = 44 hours

(iii) Students spent more than 5 hours in watching TV = 8 + 6 = 14 hours.

EXERCISE 5.2

Q1



(i) No of people liked classical music = 20

Presentage of people liked classical music = 10%

Let total no of people surveyed = x

By given condition

$$10\% \text{ of } x = 20$$

$$\frac{10}{100} \times x = 20$$

$$x = \frac{20 \times 100}{10} = 200 \text{ people.}$$

(ii) Light music is liked by maximum number of people.

(iii) Total no of CDs = 1000

Light music	Folk music	Semiclassical	classical
= 40%	= 30%	= 20%	= 10%
40% of 1000	30% of 1000	20% of 1000	10% of 1000
$\frac{40}{100} \times 1000$	$\frac{30}{100} \times 1000$	$\frac{20}{100} \times 1000$	$\frac{10}{100} \times 1000$
400 CDs	300 CDs	200 CDs	100 CDs

Q2. (i) Winter Season got the most votes

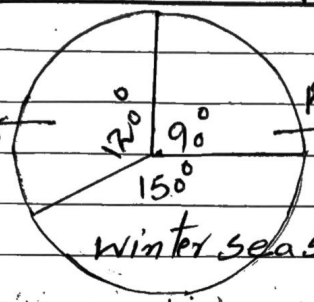
(ii) central angle = $\frac{\text{value of item}}{\text{Total value}} \times 360$

Q2. (i)

Seasons	no. of votes	central angle
Summer	90	$\frac{90}{360^\circ} \times 360^\circ = 90^\circ$
Rainy	120	$\frac{120}{360^\circ} \times 360^\circ = 120^\circ$
Winter	150	$\frac{150}{360^\circ} \times 360^\circ = 150^\circ$
Total	360	360°

(8)

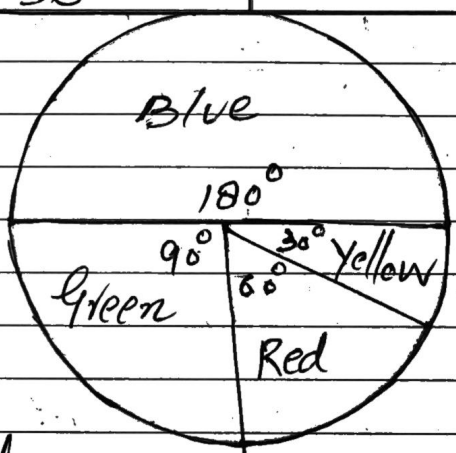
(ii)



Pie-chart

Q3.

Colours	no. of People	central angle
Blue	18	$\frac{18}{36} \times \frac{10}{360} = 180^\circ$
Green	9	$\frac{9}{36} \times \frac{10}{360} = 90^\circ$
Red	6	$\frac{6}{36} \times \frac{10}{360} = 60^\circ$
Yellow	3	$\frac{3}{36} \times \frac{10}{360} = 30^\circ$
Total	36	360°



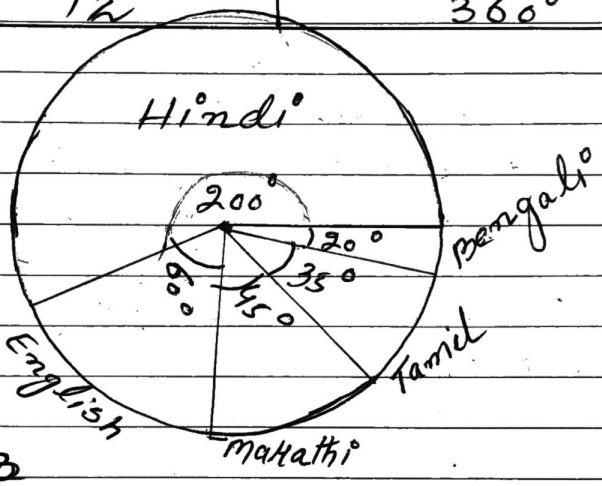
Pie-chart

Q4. Practice this question yourself

Q5

Language	no. of students	central angle
Hindi	40	$\frac{40}{72} \times 360^\circ = 200^\circ$
English	12	$\frac{12}{72} \times 360^\circ = 60^\circ$
Marathi	9	$\frac{9}{12} \times 360^\circ = 45^\circ$
Tamil	7	$\frac{7}{72} \times 360^\circ = 35^\circ$
Bengali	4	$\frac{4}{72} \times 360^\circ = 20^\circ$
Total	72	360°

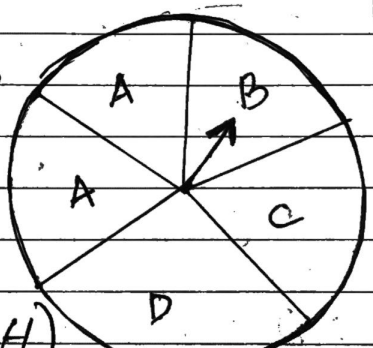
pie chart



Exercise 5.3

Q1. Sol (a) outcomes in spinning a wheel are A, B, C, D

b) out Comes When Tossing Two Coins together are :→ (HH), (TT), (HT), (TH)



Q2. When a die is Thrown, List the

(i) outcomes of an event of getting

a) A prime number: 2, 3, 5

b) Not a Prime number, 1, 4, 6

Q2

(ii) A number greater than 5 is 6

b) A number not greater than 5 are 1, 2, 3, 4

(10)

Q3 From question No 1

a) Number of outcomes possible for pointer stopping on D = 1

Total no. of outcomes of the experiment = 5

∴ P(the pointer stopping on D) = $\frac{1}{5}$

b) Total no of aces = 4

Total no of outcomes = 52

∴ P(an ace) = $\frac{4}{52} = \frac{1}{13}$

c) no. of red apples = 4

Total no of outcomes (apples) = 7

∴ P(getting a red apple) = $\frac{4}{7}$

Q4 (i) No of slip written 6 on it = 1

Total no. of outcomes (slips) = 10

P(getting a number 6) = $\frac{1}{10}$

(ii) numbers less than 6 are = 1, 2, 3, 4, 5 = 5

Total no of slips (out comes) = 10

P(getting a no. less than 6 = $\frac{5}{10} = \frac{1}{2}$

(iii) Numbers greater than 6 are 7, 8, 9, 10 = 4

∴ P(getting a no. greater than 6 = $\frac{4}{10} = \frac{2}{5}$

(iv) one digit numbers are = 1, 2, 3, 4, 5, 6, 7, 8, 9 = 9

Total number of out comes = 10

∴ P(1 digit no) = $\frac{9}{10}$

Q6 (i) From Question no 2

(a) P(a prime number) = $\frac{3}{6} = \frac{1}{2}$

(b) P(not a prime number) $\frac{2}{6} = \frac{1}{3}$

(ii) (a) P(a number greater than 5) = 1/6

(b) P(a number not greater than 5) = $\frac{4}{6} = \frac{2}{3}$

Q5 Practice yourself