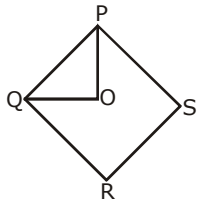
EXERCISE – 1

• Angle sum property of a Quadrilateral

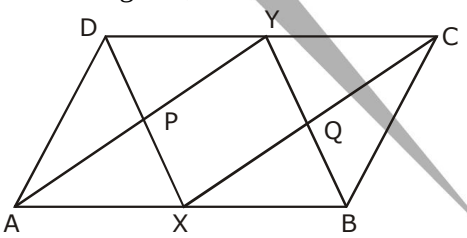
1. The angles of a quadrilateral are in ratio 1 : 2 : 3 : 4. Find all the four angles of the quadrilateral.
2. In the given figure, PQRS is a quadrilateral $\angle P$ and $\angle Q$ are bisectors of $\angle QPS$ and $\angle PQR$ respectively, then prove that $\angle QOP = \frac{1}{2}(\angle R + \angle S)$



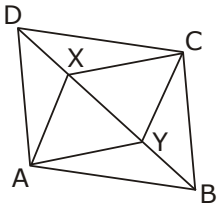
3. ABCD is a trapezium with AB || DC. If bisectors of $\angle ABC$ and $\angle BCD$ intersect each other at O, then prove that $\angle BOC = 90^0$.
4. The angles of a quadrilateral are in the ratio 3 : 5 : 9 : 13. Find all the angles of the quadrilateral.
5. In a quadrilateral ABCD, CO and DO are the bisectors of $\angle C$ and $\angle D$ respectively. Prove that $\angle COD = \frac{1}{2}(\angle A + \angle B)$
6. Can the angles 110^0, 80^0, 70^0 and 95^0 be the angles of a quadrilateral? Why or why not?
7. In quadrilateral ABCD, $\angle A + \angle D = 180^0$. What special name can be given to this quadrilateral?

• Parallelogram

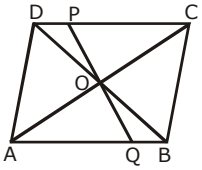
8. In the given figure, X, Y are the mid-points of sides AB and CD of a parallelogram ABCD. AY and DX are intersecting at P, CX and BY are intersecting at Q. Show that PXQY is a parallelogram.



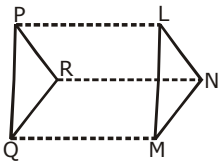
9. In the given figure, ABCD is a parallelogram and X and Y are point on the diagonal BD such that DX = BY. Prove that AXCY is a parallelogram.



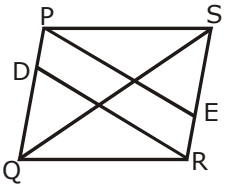
10. In the given figure, ABCD is a parallelogram whose diagonals intersect each other at O. Through O, PQ is drawn then prove that OP = OQ.



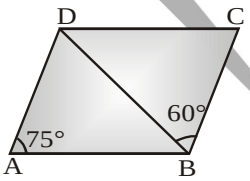
11. If ΔPQR and ΔLMN be two triangles given in such a way that PQ || LM, PQ = LM and QR = MN and QR || MN, then show that PR || LN and PR = LN.



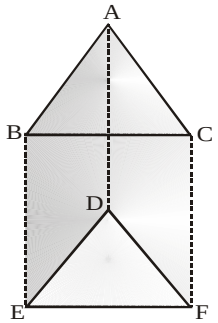
12. PQRS is a parallelogram D is a point that PD = $\frac{1}{3}$ PQ and E is a point such that RE = $\frac{1}{3}$ RS. Show that quadrilateral PDRE is a parallelogram.



13. Prove that, in a parallelogram :
    (i) opposite sides are equal (ii) opposite angles are equal
    (iii) diagonals bisect each other.
14. Define an isosceles trapezium. ABCD is an isosceles trapezium with $\angle B = 60^o$ and AD || BC. Side AD is produced till E such that AE = BC, CE is joined. Find $\angle DCE$.
15. Two opposite angles of a parallelogram are
    (3x – 2)° and (50–x)°. Find the measure of each angle of the parallelogram.
16. If an angle of a parallelogram is two-third of its adjacent angle, find the angles of the parallelogram.
17. Find the measure of all the angles of a parallelogram, if one angle is 24° less than twice the smallest angle.
18. The perimeter of a parallelogram is 22 cm. If the longer side measures 6.5 cm what is the measure of the shorter side?
19. In a parallelogram ABCD,∠D = 135°, determine the measures of∠A, and ∠B.
20. ABCD is a parallelogram in which∠A = 70°. Compute ∠B, ∠C and∠D.
21. In figure ABCD is a parallelogram in which∠DAB = 75° and ∠DBC = 60°



    Compute ∠CDB and∠ADB.
22. In a ΔABC median AD is produced to X such that AD = DX. Prove that ABXC is a parallelogram.
23. In a parallelogram, show that the angle bisector of two adjacent angles intersect at right angles.
24. In figure ΔABC and ΔDEF are such that AB = DE, BC = EF, AB || DE and BC || EF.



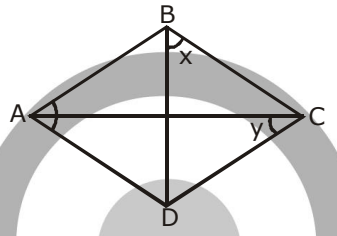
    Show that
    (i) ABED is a parallelogram.

(ii) BEFC is a parallelogram.
(iii) ADFC is a parallelogram.

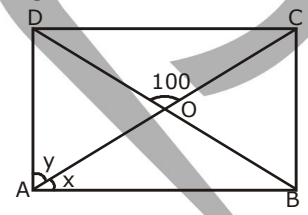
25. The sides AB and CD of a parallelogram ABCD are bisected at E and F. Prove that EBFD is a parallelogram.
26. Which of the following statements are true (T) and which are false (F)?
    (i) In a parallelogram, the diagonals are equal
    (ii) In a parallelogram, the diagonals bisect each other.
    (iii) In a parallelogram, the diagonals intersect each other at right angles.
    (iv) In any quadrilateral, if a pair of opposite sides is equal, it is a parallelogram
    (v) If all the angles of a quadrilateral are equal, it is a parallelogram
    (vi) If three sides of a quadrilateral are equal, it is a parallelogram
    (vii) If all the sides of a quadrilateral are equal it is a parallelogram

• Rectangle, Rhombus and Square:

27. ABCD is a rhombus with one $\angle BAD = 50^{\circ}$, find $\angle x$ and $\angle y$ in given figure.



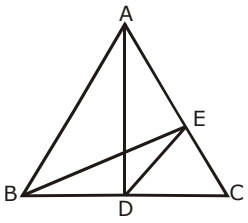
28. Show that the diagonals of a square are equal and perpendicular to each other.
29. Prove that the bisectors of the angles of a parallelogram enclose a rectangle.
30. In the given figure, ABCD is a rectangle. Find x and y.



31. ABCD is a square. AC and BD intersect at O. State the measure of $\angle$ AOB.
32. ABCD is a rectangle with $\angle ABD = 40°$. Determine $\angle DBC$
33. The sides AB and CD of a parallelogram ABCD are bisected at E and F. Prove that EBFD is a parallelogram.
34. P and Q are the points of trisection of the diagonal BD of a parallelogram ABCD. Prove that CQ is parallel to AP. Prove also that AC bisects PQ.
35. ABCD is a square E, F, G and H are points on AB, BC, CD and DA respectively, such that AE = BF = CG = DH. Prove that EFGH is a square.
36. ABCD is a rhombus, EABF is a straight line such that EA = AB = BF. Prove that ED and FC when produced meet at right angles.
37. ABCD is a parallelogram, AD is produced to E so that DE = DC and EC produced meets AB produced in F. Prove that BF = BC.

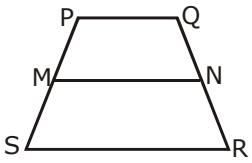
• Midpoint theorem

38. In the given figure, AD is median and DE || AB .Prove that BE is the median.

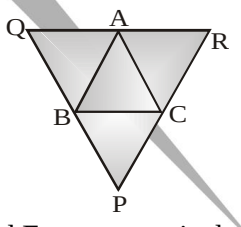


39. Prove that the figure formed by joining the midpoint of the pairs of consecutive sides of a quadrilateral is a parallelogram.
40. Show that the line segment joining the mid-points of the sides of quadrilateral bisect each other.
41. M and N are the mid-points of non parallel sides of a trapezium PQRS. Prove that

    (a) MN || PQ (b) MN = $\frac{1}{2}$ (PQ + RS)

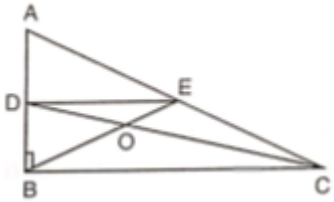


42. Show that the four triangles formed by joining the mid-point of the three sides of a triangle are congruent to each other.
43. Prove that in a triangle, the line segment joiningthe mid points of any two sides is parallel to the third side and is half of it.
44. State and prove converse of mid point theorem.
45. P, Q, R are respectively the mid points of sides BC, CA and AB of DABC. PR and BQ intersect each other at M and PQ and CR intersect each other at N. Prove that MN || BC and MN = $\frac{1}{4}$ BC.
46. Given ΔABC, lines are drawn through A, B and C parallel respectively to the sides BC, CA and AB forming ΔPQR. Show that BC = $\frac{1}{2}$ QR.

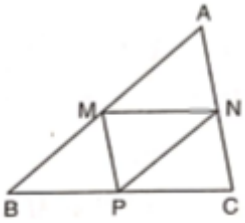


47. In a ΔABC, D, E, and F are, respectively, the mid-points of BC, CA and AB. If the lengths of side AB, BC and CA are 7 cm, 8 cm and 9 cm, respectively, find the perimeter of ΔDEF.
48. In fig., triangle ABC is right-angled at B. Given that AB = 9 cm, AC = 15 cm and D, E are the mid-points of the sides AB and AC respectively, calculate

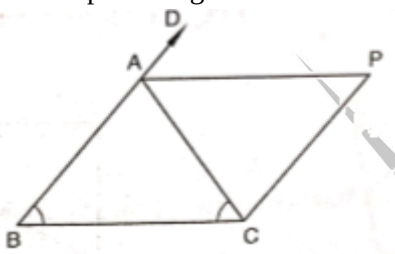
    (i) The length of BC (ii) The area of ΔADE.



49. In fig., M, N and P are the mid-points of AB, AC and BC respectively. If MN = 3 cm, NP = 3.5 cm and MP = 2.5 cm, calculate BC, AB and AC.



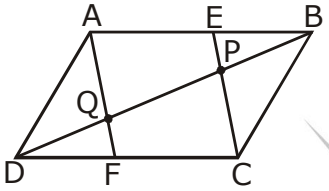
50. In fig., AB = AC and CP || BA and AP is the bisector of exterior $\angle$CAD of ΔABC. Prove that (i) $\angle$PAC = $\angle$ BCA (ii) ABCP is a parallelogram.



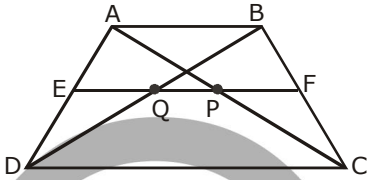
51. ABCD is a kite having AB = AD and BC = CD. Prove that the figure formed by joining the mid-points of the sides, in order, is a rectangle.

EXERCISE – 2

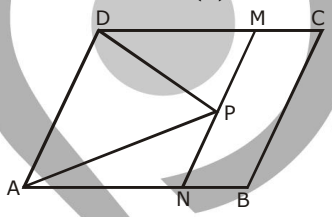
1. ABCD is a parallelogram. P and Q trisect BD. AQ is joined which meets DC at F when produced also CP is joined which meets AB at E when produced. If AECF is a parallelogram, prove that E and F are the mid points of sides AB and CD respectively.



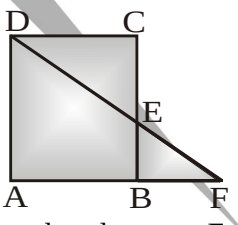
2. In the given figure ABCD is a trapezium with AB || DC. E is the mid point of AD and EF || DC. EF intersects diagonals AC and BD at P and Q respectively. Prove that AC is bisected at P and BD is bisected at Q.



3. ABCD is a parallelogram as shown in the figure. Bisectors of angles BAD and CDA intersect each other at P. Through P a line MPN is drawn parallel to AD. Prove that:
   (i) AN = DM (ii) MP = NP.

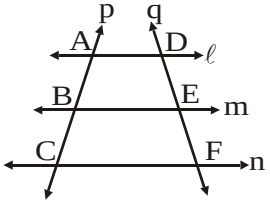


4. In figure ABCD is a parallelogram and E is the mid-point of side BC.



   If DE and AB when produced meet at F, prove that AF = 2AB.

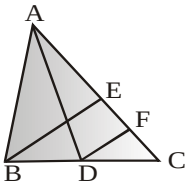
5. In figure, three parallel lines l, m and n are intersected by a transversal p at points A, B and C respectively and transversal q at D, E and F respectively.



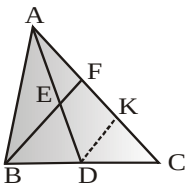
   If AB : BC = 1 : 2, prove that DE : EF = 1 : 2.

6. ΔABC is a triangle right angled at B; and P is the mid-point of AC .Prove that:
   (i) PQ ⊥ AB (ii) Q is the midpoint of AB (iii) PB = PA = $\frac{1}{2}$AC.

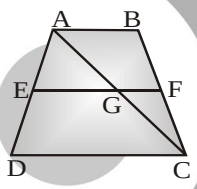
7. In figure AD and BE are two medians of ΔABC and BE||DF. Prove that $CF = \frac{1}{4}AC$



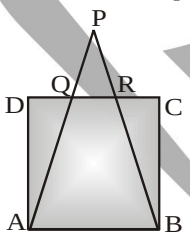
8. In ΔABC, AD is the median through A and E is the mid-point of AD, BE produced meets AC in F. Prove that $AF = \frac{1}{3}AC$



9. P is the mid-point of side AB of a parallelogram ABCD. A line through B parallel to PD meets DC at Q and AD produced at R .Prove that (i) AR = 2BC (ii) BR = 2BQ.
10. In figure, ABCD is a trapezium in which side AB is parallel to side DC and E is the mid-points of side AD. If F is a point on the side BC such that the segments EF is parallel to side DC. Prove that F is the mid-point of BC and $EF = \frac{1}{2}(AB + DC)$

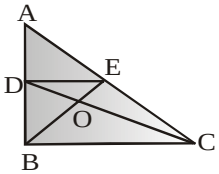


11. In the figure, ABCD is a square and PAB is a triangle such that AQ = BR.



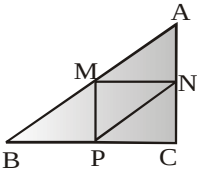
Prove that PQR is an isosceles triangle.

12. In a triangle ABC, ∠A = 50°, ∠B = 60° and ∠C = 70°. Find the measures of the angles of the triangle formed by joining the mid-points of the sides of this triangle.
13. In a triangle, P,Q, and R are the mid-points of sides BC, CA and AB respectively. If AC = 21 cm, BC = 29 cm and AB = 30 cm, find the perimeter of the quadrilateral ARPQ.
14. In figure, triangle ABC is right-angled at B. Given that AB = 9cm, AC = 15cm and D, E are the mid-points of the sides AB and AC respectively, calculate



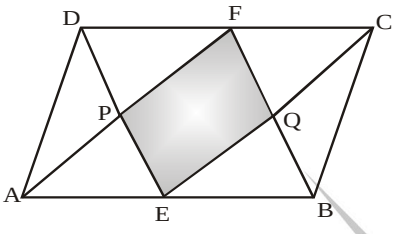
(i) The length of BC (ii) The area of ΔADE

15. In figure, M, N and P are the mid-points of AB, AC and BC respectively.



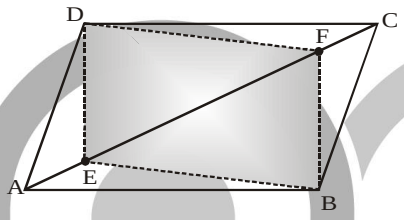
If MN = 3cm, NP = 3.5 cm and MP = 2.5cm, calculate BC, AB and AC.

16. ABC is a triangle and through A, B, C lines are drawn parallel to BC, CA and AB respectively intersecting at P, Q and R. Prove that the perimeter of ΔPQR is double the perimeter of ΔABC.
17. In figure, ABCD is a parallelogram. E and F are mid-points of the sides AB and CD respectively.AF and DE intersects at P , BF and CE intersects at Q.



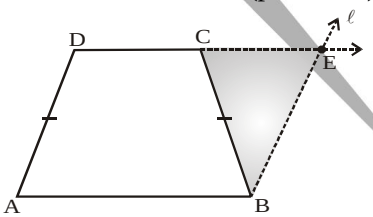
Prove that
(i) AECF is a parallelogram
(ii) BEDF is a parallelogram.
(iii) PEQF is a parallelogram.

18. In figure, ABCD is a parallelogram. E and F are two points on the diagonal AC such that AE = CF.



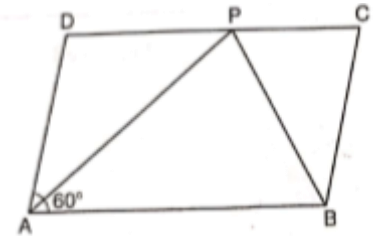
Show that
(i) $\Delta AEB \cong \Delta CFD$
(ii) $\Delta AED \cong \Delta CFB$
(iii) $\Delta BEF \cong \Delta DFE$
(iv) BEDF is a parallelogram.

19. In figure, ABCD is a trapezium such that AB || CD and AD = BC. Line l drawn through the vertex B and parallel to AD meets DC (produced) at E

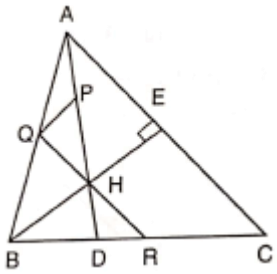


Show that
(i) ABED is a parallelogram.
(ii) $\angle A + \angle C = \angle B + \angle D = 180°$.

20. In fig., ABCD is a parallelogram in which $\angle A = 60^0$. If the bisectors of $\angle A$ and $\angle B$ meet at P, prove that AD = DP, PC = BC and DC = 2AD.



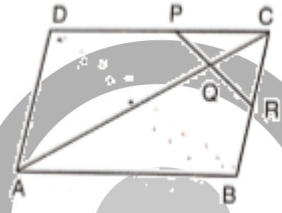
21. In fig., BE $\perp$ AC. AD is any line from A to BC intersecting BE in H.P, Q and R are respectively the mid-points of AH, AB and BC. Prove that $\angle PQR = 90^0$



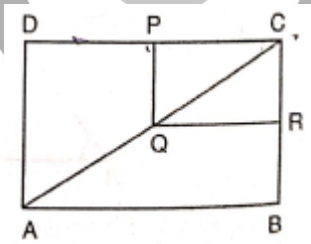
22. ABC is a triangle. D is a point on AB such that AD = $\frac{1}{4}AB$ and E is a point on AC such that AE = $\frac{1}{4}$ AC.

    Prove that DE = $\frac{1}{4}$ BC.

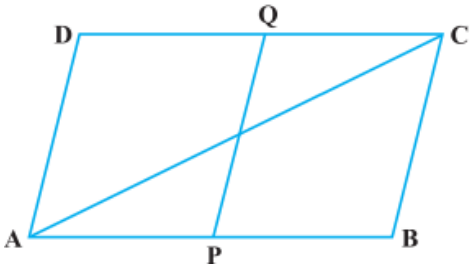
23. In fig., ABCD is parallelogram in which P is the mid-point of DC and Q is a point on AC such that CQ = $\frac{1}{4}$ AC. If PQ produced meets BC at R, prove that R is a mid-point of BC.



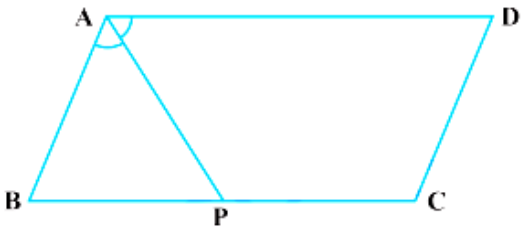
24. In fig., ABCD and PQRC are rectangles and Q is the mid-point of AC. Prove that (i) DP = PC (ii) PR = $\frac{1}{2}$ AC.



25. ABCD is a parallelogram, E and F are the mid-points of AB and CD respectively. GH is any line intersecting AD, EF and BC at G,P and H respectively. Prove that GP = PH.
26. BM and CN are perpendiculars to a line passing through the vertex A of a triangle ABC. If L is the mid-point of BC, prove that LM = LN.
27. D, E and F are the mid-points of the sides BC, CA and AB, respectively of an equilateral triangle ABC. Show that Δ DEF is also an equilateral triangle.
28. Points P and Q have been taken on opposite sides AB and CD, respectively of a parallelogram ABCD such that AP = CQ (Fig.). Show that AC and PQ bisect each other.



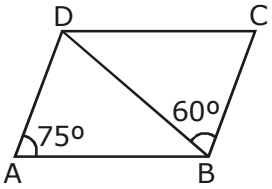
29. In Fig., P is the mid-point of side BC of a parallelogram ABCD such that ∠BAP = ∠DAP. Prove that AD = 2CD.



30. Prove that the quadrilateral formed by the bisectors of the angles of a parallelogram is a rectangle.
31. P and Q are points on opposite sides AD and BC of a parallelogram ABCD such that PQ passes through the point of intersection O of its diagonals AC and BD. Show that PQ is bisected at O.
32. ABCD is a rectangle in which diagonal BD bisects ∠B. Show that ABCD is a square.
33. D, E and F are respectively the mid-points of the sides AB, BC and CA of a triangle ABC. Prove that by joining these mid-points D, E and F, the triangles ABC is divided into four congruent triangles.
34. Prove that the line joining the mid-points of the diagonals of a trapezium is parallel to the parallel sides of the trapezium.
35. P is the mid-point of the side CD of a parallelogram ABCD. A line through C parallel to PA intersects AB at Q and DA produced at R. Prove that DA = AR and CQ = QR.

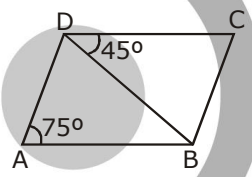
EXERCISE – 3

1. In the given figure, ABCD is a parallelogram in which $\angle BAD = 75^\circ$ and $\angle CBD = 60^\circ$. Then, $\angle$ BDC =



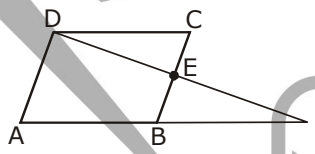
(a) 60° (b) 75° (c) 45° (d) 50°

2. The bisectors of any two adjacent angles of a parallelogram intersect at
(a) 30° (b) 45° (c) 60° (d) 90°
3. If an angle of a parallelogram is two-third of its adjacent angle, the smallest angle of the parallelogram is
(a) 108° (b) 54° (c) 72° (d) 81°
4. If one angle of a parallelogram is 24° less than twice the smallest angle, then the largest angle of the parallelogram is
(a) 68° (b) 102° (c) 112° (d) 136°
5. In the given figure, ABCD is a parallelogram in which $\angle BDC = 45^\circ$ and $\angle BAD = 75^\circ$. Then $\angle CBD$ =



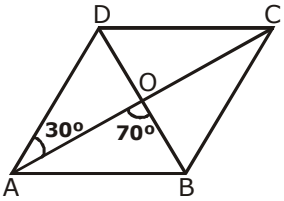
(a) 45° (b) 55° (c) 60° (d) 75°

6. In the given figure ABCD is a ||gm and E is the mid-point of BC. Also, DE and AB when produced meet at F. Then :



(a) AF = $\frac{3}{2}$ AB (b) AF = 2AB (c) AF = 3AB (d) $AF^2 = 2AB^2$

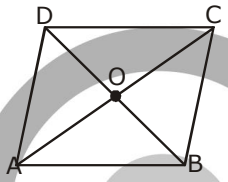
7. Which of the following is not true for a parallelogram
(a) Opposite sides are equal
(b) Opposite angles are equal
(c) Opposite angles are bisected by the diagonals
(d) Diagonals bisect each other
8. The diagonals AC and BD of a parallelogram ABCD intersect each other at the point O such that $\angle DAC = 30^\circ$ and $\angle AOB = 70^\circ$. Then, $\angle DBC$ =



(a) 40° (b) 35° (c) 45° (d) 50°

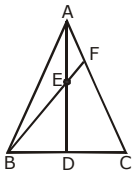
9. In which of the following figures are the diagonals equal?
(a) Parallelogram (b) Rhombus (c) Trapezium (d) Rectangle

10. If the diagonals of a quadrilateral bisect each other at right angles, then the figure is a
    (a) trapezium (b) parallelogram (c) rectangle (d) rhombus
11. The lengths of the diagonals of a rhombus are 16 cm and 12 cm. The length of each side of the rhombus is
    (a) 10 cm (b) 12 cm (c) 9 cm (d) 8 cm
12. The length of each of side a rhombus is 10 cm and one of its diagonals is of length 16 cm. The length of the other diagonals is
    (a) 13 cm (b) 12 cm (c) 10 cm (d) 6 cm
13. If ABCD is a parallelogram with two adjacent angles $\angle A = \angle B$, then the parallelogram is a
    (a) rhombus (b) trapezium (c) rectangle (d) none of these
14. The bisectors of the angles of a parallelogram enclose a
    (a) rhombus (b) square (c) rectangle (d) parallelogram
15. In a rectangle ABCD, P and Q are the mid – points of BC and AD respectively and R is any point of PQ. Then are (ΔARB) equals
    (a) $\frac{1}{2}$ (Δ ABCD) (b) $\frac{1}{3}$ (Δ ABCD) (c) $\frac{1}{4}$ (Δ ABCD) (d) None of these
16. In the given figure, ABCD is a rhombus. Then



    (a) $AC^2 + BD^2 = AB^2$ (b) $AC^2 + BD^2 = 2AB^2$
    (c) $AC^2 + BD^2 = 4AB^2$ (d) $2(AC^2 + BD^2) = 3AB^2$
17. If $\angle A, \angle B, \angle C$ and $\angle D$ of a quadrilateral ABCD taken in order, are in the ratio 3 : 7 : 6 : 4, then ABCD is a
    (a) rhombus (b) kite (c) trapezium (d) parallelogram
18. If APB and CQD are two parallel lines ,then the bisectors of $\angle APQ, \angle BPQ, \angle CQP$ and $\angle PQD$ enclose a
    (a) square (b) rhombus (c) rectangle (d) kite
19. Three statements are given below :
    I. In a rectangle ABCD, the diagonal AC bisects $\angle A$ as well as $\angle C$.
    II. In a square ABCD, the diagonal AC bisects $\angle A$ as well as $\angle C$.
    III. In a rhombus ABCD, the diagonal AC bisects $\angle A$ as well as $\angle C$. Which is true ?
    (a) I only (b) II and III (c) I and III (d) I and II
20. In which of the following is the lengths of diagonals equal ?
    (a) Rhombus (b) Parallelogram (c) Trapezium (d) Rectangle
21. The length of a side of a rhombus is 5 m and one of its diagonals is of length 8 m. The length of the other diagonal is –
    (a) 5 m (b) 7 m (c) 6 m (d) 8 m
22. The figure formed by joining the mid-points of the adjacent sides of a quadrilateral is a
    (a) rhombus (b) square (c) rectangle (d) parallelogram
23. The figure formed by joining the mid-points of the adjacent sides of a square is a
    (a) rhombus (b) square (c) rectangle (d) parallelogram
24. The figure formed by joining the mid-points of the adjacent sides of a parallelogram is a
    (a) rhombus (b) square (c) rectangle (d) parallelogram
25. The figure formed by joining the mid-points of the adjacent sides of a rectangle is a
    (a) rhombus (b) square (c) rectangle (d) parallelogram
26. The figure formed by joining the mid-points of the adjacent sides of a rhombus is a
    (a) rhombus (b) square (c) rectangle (d) parallelogram

27. In the given figure, AD is median of ΔABC and E is the mid-point of AD. If BE is joined and produced to meet AC in F, then AF =?



(a) $\frac{1}{2}$AC (b) $\frac{1}{3}$AC (c) $\frac{2}{3}$AC (d) $\frac{3}{4}$AC

28. Three statements are given below:

I. In a ||gm, the angle bisectors of two adjacent angles enclose a right angle.

II. The angle bisectors of a ||gm form a rectangle.

III. The triangle formed by joining the mid-points of the sides of an isosceles triangle is not necessarily an isosceles triangle. Which is true

(a) I only (b) II only (c) I and II (d) II and III

29. In a rectangle longer side is twice the smaller side, then ratio of longer side to its diagonal is:

(a) $\sqrt{2}:5$ (b) $5:\sqrt{2}$ (c) $2:\sqrt{5}$ (d) $\sqrt{5}:2$

30. A square ABCD has an equilateral triangle drawn on the side AB (interior of the square.) The triangle has vertex at G. What is the measure of the angle DGC?

(a) 160^0 (b) 150^0 (c) 75^0 (d) 90^0

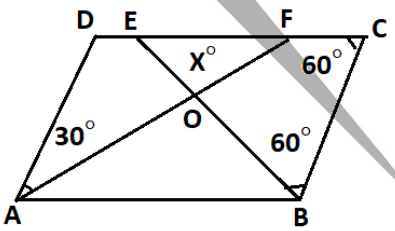
31. In aΔABC, P, Q and R are the mid – points of the sides BC, CA and AB respectively. If AC = 16 cm, BC = 20 cm and AB = 24 cm, then perimeter of the quadrilateral ARPQ will be:

(a) 60 cm (b) 30 cm (c) 40 cm (d) None of these

32. LMNO is a trapezium with LM || NO. If P and Q are the mid – points of LO and MN respectively and LM = 5 cm and NO = 10 cm, then PQ =

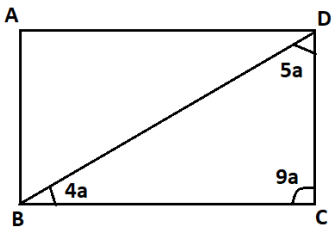
(a) 2. 5 cm (b) 5 cm (c) 7.5 cm (d) 15 cm

33. In the adjoining figure ABCD is a parallelogram, then the measure of x is:



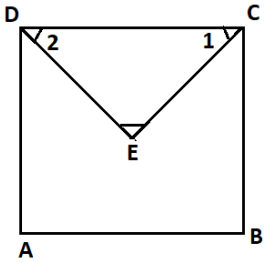
(a) 45^0 (b) 60^0 (c) 90^0 (d) 135^0

34. In the given figure, find ∠A in the parallelogram ABCD.



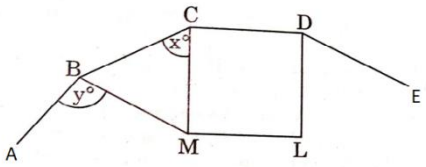
(a) 90^0 (b) 60^0 (c) 30^0 (d) 110^0

35. In the given figure, ABCD is a quadrilateral, the line segment bisecting ∠C and ∠D meet at E. Then 2 ∠CED is equal to:



(a) $\angle A + \angle B$ (b) $\angle A + \angle C$ (c) $\angle B + \angle D$ (d) $\angle C + \angle D$

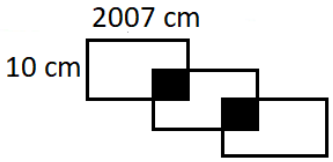
36.ABCDE…….. is part of a regular polygen which has interior angles of 160°. CDLM is square.



Find the value of x and y respectivley –

(a) 70, 105 (b) 70, 150 (c) 105, 70 (d) 150, 70

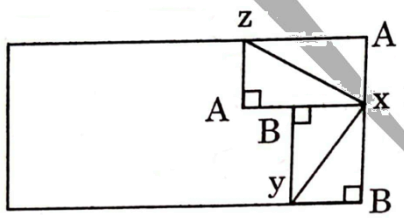
37.Three identical rectangles are overlapping as in the diagram. The length and breadth of each rectangle are respectivley 2007 cm and 10 cm. The area of each of the shaded square portion is 16 cm².



The perimeter of the outer boundary of figure in cm is

(a) 10070 (b) 12070 (c) 14070 (d) 11070

38.A rectangular sheet of paper is folded so that the corners A, B go to A' B' as in the figure. Then $\angle ZXY$ –



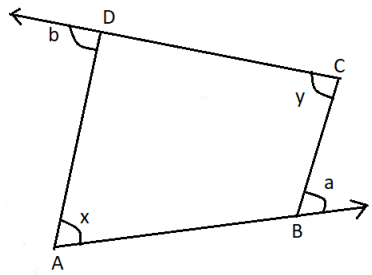
(a) An acute angle (b) An obtuse angle

(c) A right angle (d) A variable angle depending on the point X

39.A quadrilateral ABCD has four angles x°, 2x°, $\frac{5x^\circ}{2}$ and $\frac{7x^\circ}{2}$ respectively. What is the difference between the value of biggest and the smallest angles

(a) 40^0 (b) 100^0 (c) 80^0 (d) 20^0

40.Sides AB and CD of a quadrilateral. ABCD are extended as in figure. Then a + b is equal to:



(a) x + 2y (b) x – y (c) X + y (d) 2x + y

41. Which of the following statements is false for the quadrilateral ABCD?

(a) AB + BC + CD + DA> AC (b) AB + BC + CD + DA > AB + AC

(c) AB + BC + CD + DA > AC + BD (d) AB + BC + CD + DA <2AC

42. Choose the correct figure that has all the following properties

(i) Both the diagonals are congruent

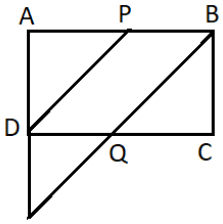
(ii) It is called as rectangle

(iii) The perimeter of the figure is four times its length or breadth

(iv) It is Rhombus

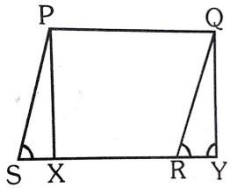
(a) Rhombus (b) Rectangle (c) Trapezium (d) Square

43. P is the mid-point of side AB to a parallelogram ABCD. A line through B parallel to PD meets DC at Q and AD produced at R. Then BR is equal to :



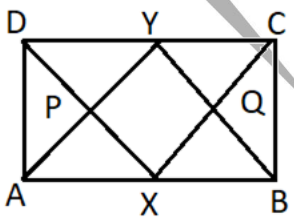
(a) BQ (b) $\frac{1}{2}$ (c) 2BQ (d) None of these

44. PQRS is a parallelogram. PX and QY are, respectively, the perpendicular from P and Q to SR and SR produced. The PX is equal to :



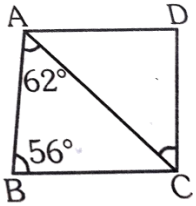
(a) QY (b) 2QY (c) $\frac{1}{2}$QY (d) XR

45. X, Y are the mid – points of opposite sides AB and DC of a parallelogram ABCD. AY and DX are joined intersecting in P; CX and BY are joined intersecting in Q. the PXQY is a:



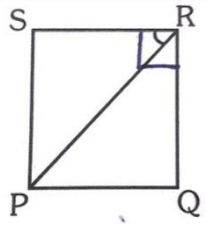
(a) Rectangle (b) Rhombus (c) Parallelogram (d) Square

46. ABCD is a rhombus with <ABC = 56°; then ∠ ACD is equal to:



(a) 90^0 (b) 60^0 (c) 56^0 (d) 62^0

47. PQRS is a square. The ∠ SRP is equal to:

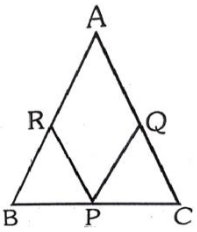


(a) 45^0 (b) 90^0 (c) 100^0 (d) 60^0

48. ABCD is a trapezium in which AB || DC and AD = BC. If P, Q, R, S be respectively the mid-points of BA, BD and CD, CA. Then PQRS is a:

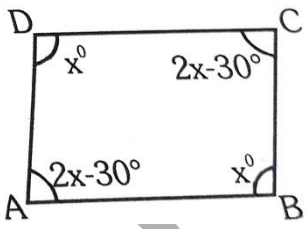
(a) Rhombus (b) Rectangle (c) Paralleogram (d) Square

49. In a ΔABC, P, Q, and R the mid-points of sides BC, CA and AB respectively. If AC = 21 cm, BC = 29 cm and AB = 30 cm. The perimeter of the quad. ARPQ is:



(a) 91 cm (b) 60 cm (c) 51 cm (d) 70 cm

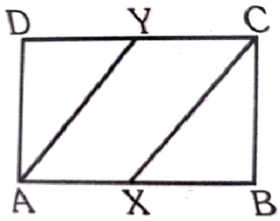
50. Find the measure of each angle of a parallelogram, if one of its angle is 30° less than twice the smallest angle.



(a) $60°, 100°, 90°, 20°$ (b) $80°, 40°, 120°, 90^0$

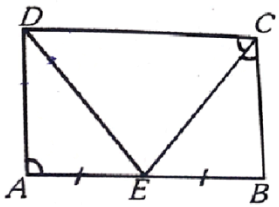
(c) $100°, 90°, 90°, 80°$ (d) $70°, 110°, 70°, 110°$

51. ABCD is a parallelogram and X, Y are the mid-points of sides AB and CD respectively. Then quadrilateral. AXCY is a :



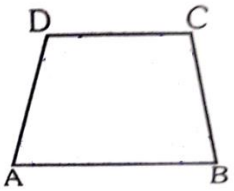
(a) Parallelogram (b) Rhombus (c) Square (d) Rectangle

52. ABCD is a parallelogram, E is the mid-point of AB and CE bisects ∠ BCD. The ∠ DEC is :



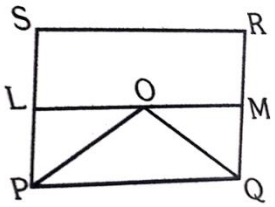
(a) 60^0 (b) 90^0 (c) 100^0 (d) 120^0

53. The measures of the angles of a quadrilateral ABCD are respectively in the ratio 1: 2: 3: 4. Then which of the following is true.



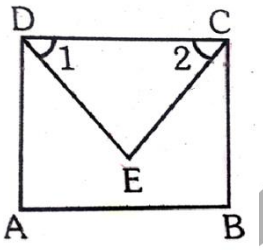
(a) AC = BD (b) AD || BC (c) AB || DC (d) None of these

54. In the given figure, PQRS is a parallelogram. PO and QO are respectively, the bisectors of $\angle$P and $\angle$Q. Line LOM is drawn parallel to PQ. Then PL is equal to:



(a) PQ (b) QR (c) QM (d) OQ

55. In a quadrilateral ABCD, the line segments bisecting $\angle$C and $\angle$D meet at E. Then $\angle$A + $\angle$B is equal to:

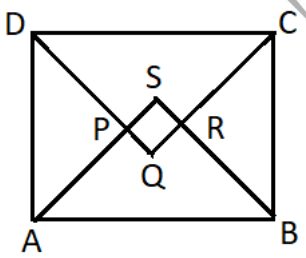


(a) $\angle$CED (b) $\frac{1}{2}\angle$CED (c) 2$\angle$CED (d) None of these

56. The exterior angle of a regular polygon is one-third of its interior angle. The number of the sides of the polygon is:

(a) 9 (b) 8 (c) 10 (d) 12

57. The bisectors of the angles of a parallelogram encloses a :



(a) Rhombus (b) Rectangle (c) Square (d) None of these

58. The interior angle of a regular polygon is 108°. The number of sides of the polygon is:

(a) 6 (b) 7 (c) 8 (d) 5

59. One angle of a pentagon is 140°. If the remaining angles are in the ratio 1 : 2 : 3 : 4. The size of the greatest angle is

(a) 150° (b) 180° (c) 160° (d) 170°

60. ABCDE is a regular pentagon, Diagonal AD divides $\angle$CDE in two parts, then the ratio of $\frac{\angle ADE}{\angle ADC}$ is equal to

(a) 3 : 1 (b) 1 : 4 (c) 1 : 3 (d) 1 : 2

61. The ratio of the measure of an angle of a regular octagon to the measure of its exterior angle is
(a) 1 : 2 (b) 3 : 1 (c) 2 : 3 (d) 3 : 4

62. The ratio of an interior angle to the exterior angle of a regular polygon is 7 : 2. The number of sides of the polygon is:
(a) 9 (b) 19 (c) 7 (d) 8

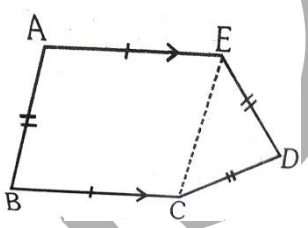
63. How many diagonals are there in a hexagon?
(a) 6 (b) 4 (c) 11 (d) 9

64. The sum of the interior angles of a polygon is three times the sum of its exterior angles. The number of sides of the polygon is:
(a) 5 (b) 6 (c) 7 (d) 8

65. Each interior angles of a regular polygon is 144°. Find the interior angle of a regular polygon which has double the number of sides as the first polygon.
(a) 100° (b) 160° (c) 36° (d) 162°

66. ABCDE is a regular pentagon. The bisector of $<$A of the pentagon meets the side CD in M. Then the measure of $\angle$AMC is:
(a) 54° (b) 45° (c) 90° (d) 100°

67. In the given figure AE = BC and AE || BC and the three sides AB, CD and ED are equal in length. Find the measure of $\angle$ECD.



(a) 138° (b) 60° (c) 88° (d) None of these

68. ABCD is a square, A is joined to a point P on BC and D is joined to a point Q and AB. If AP = DQ and AP intersects DQ at R, then $\angle$DRP is
(a) 60° (b) 120° (c) 90° (d) Can't be determined

69. A point X inside a rectangle PQRS is joined to the vertices then, which of the following is true?
(a) Area (ΔPSX) = Area (ΔRXQ)
(b) Area (ΔPSX) + Area (ΔPXQ) = Area (ΔRSX) = Area (ΔRQX)
(c) Area (ΔPXS) = Area (ΔRXQ) = Area (ΔSRX) = Area (ΔPXQ)
(d) None of the above

70. If ABCD is a parallelogram in which P and Q are the centroids of ΔABD and ΔBCD, then , PQ equals
(a) AQ (b) AP (c) BP (d) DQ

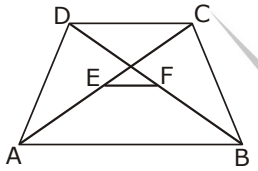
71. Diagonals of a parallelogram are 8m and 6m respectively. If one of sides is 5m, then the area of parallelogram is
(a) 18m² (b) 30 m² (c) 24 m² (d) 48 m²

72. (ΔABCD) is a parallelogram, AB = 14 cm, BC = 18cm and AC = 16 cm. Find the length of the other diagonal
(a) 24 cm (b) 28 cm (c) 36 cm (d) 32 cm

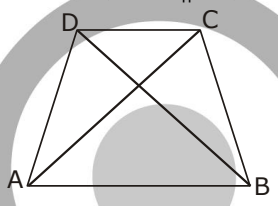
73. ABCD is parallelogram. The diagonals AC and BD intersect at a point "O". If E, F, G and H are the mid – points of AO, DO, CO and BO respectively, then the ratio of (EF + FG + GH + HE) to (AD + DC + CB + BA) is
(a) 1 : 1 (b) 1 : 2 (c) 1 : 3 (d) 1 : 4

EXERCISE – 4

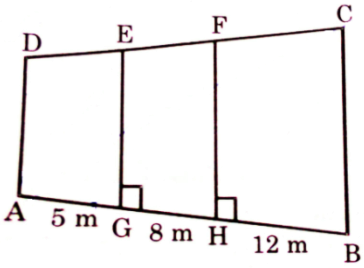
1. If area of a ||gm with sides a and b is A and that of a rectangle with sides a and b is B, then
   (a) A > B (b) A = B (c) A < B (d) A ≥ B
2. The parallel sides of a trapezium are a and b respectively. The line joining the mid-points of its non-parallel sides will be
   (a) $\frac{1}{2}$ (a – b) (b) $\frac{1}{2}$ (a + b) (c) $\frac{2ab}{(a+b)}$ (d) $\sqrt{ab}$
3. In a trapezium ABCD, if E and F be the mid-points of the diagonals AC and BD respectively. Then EF =



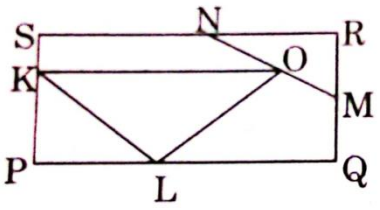
   (a) $\frac{1}{2}$ AB (b) $\frac{1}{2}$ CD (c) $\frac{1}{2}$ (AB + CD) (d) $\frac{1}{2}$ (AB – CD)
4. In a trapeziumABCD,if AB||CD, then ($AC^2 + BD^2$) =



   (a) $BC^2 + AD^2 + 2BC.AD$ (b) $AB^2 + CD^2 + 2AB.CD$
   (c) $AB^2 + CD^2 + 2AD.BC$ (d) $BC^2 + AD^2 + 2AB.CD$
5. Two parallelogram stand on equal bases and between the same parallels. The ratio of their areas is
   (a) 1 : 2 (b) 2 : 1 (c) 1 : 3 (d) 1 : 1
6. If ABCD is a parallelogram and E, F are the centroids of Δ s ABD and BCD respectively, then EF equals –
   (a) AE (b) BE (c) CE (d) DE
7. If a rectangle and a parallelogram are equal in area and have the same base and are situated on the same side, then the quotient: Perimeter of rectangle Perimeter of || gm is :
   (a) equal to 1 (b) greater than 1 (c) less than 1 (d) indeterminate
8. If ABCD is a rectangle, E, F are the mid points of BC and AD respectively and G is any point on EF, then D GAB equals :
   (a) $\frac{1}{2}$ (||ABCD) (b) $\frac{1}{3}$ (||ABCD) (c) $\frac{1}{4}$ (||ABCD) (d) $\frac{1}{6}$ (||ABCD)
9. ABCD is a quadrilateral piece of land in which DC = 30 m. The land has been divided into three parts as shown in the figure. If DA || EG || FH || BC, AG = 5 m, GH = 8 and HB = 12 m then the length of DE =

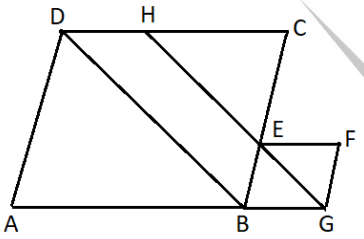


   (a) 3 m (b) 4 m (c) 5 m (d) 6 m
10. In the figure, PQRS is a rectangle of area 2011 square units. K, L, M, N are the mid points of the respective sides. O is the mid point of MN. The area of the triangle OKL is equal to (in square units)



(a) $\frac{2011}{5}$ (b) $\frac{2(2011)}{5}$ (c) $\frac{2011}{4}$ (d) $\frac{3(2011)}{8}$

11. In the adjoining figure ABCD and BGFE are rhombus. AB = cm, GF = 3 cm. GE meets DC at H. $<A = 60°$. The perimeter ABEHD is (in cm)

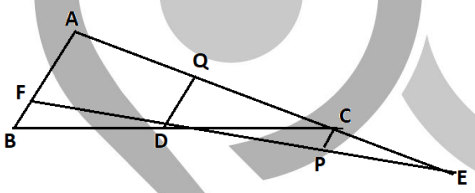


(a) 47 (b) 40 (c) 39 (d) 33

12. How many diagonals are there in a decagon?

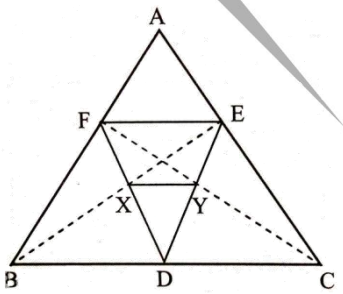
(a) 19 (b) 29 (c) 35 (d) 45

13. In the given figure, the side AC of ΔABC is produced to E such that CE = $\frac{1}{2}$ AC. If D is the midpoint of BC and ED produced meets AD at F and CP. DQ are drawn parallel to BA, then FD:



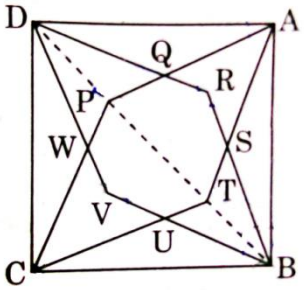
(a) $\frac{1}{2}$ FE (b) $\frac{1}{3}$ FE (c) 2FE (d) FE

14. In the given figure, D, E and F are the midpoints of the sides BC, CA and AB of ΔABC. BE and DF intersect at X while CF and DE interesect at Y, then BC = a XY. Find the value of a.



(a) 3 (b) 4 (c) 2 (d) $\frac{1}{4}$

15. The figure below is made up of a square ABCD and two rhombuses, ATCP and DRBV.



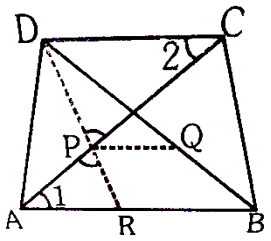
Give that <BVD = 135° and AT = BR, then find <PCT and <ABD respectively –

(a) 135°, 135° (b) 135°, 45° (c) 45°, 135° (d) 45°, 45°

16. Two regular polygons of different number of sides are taken. In one of them, its sides are coloured red and diagonals are coloured green: in the other, sides are coloured green and diagonals are coloured red. Suppose there are 103 red lines and 80 green lines. The total number of sides the two polygons together have is:

(a) 23 (b) 28 (c) 33 (d) 38

17. ABCD is a trapezium and P, Q are the mid-points of the diagonals AC and BD. Then PQ is equal to:



(a) $\frac{1}{2}$ (AB) (b) $\frac{1}{2}$ (CD) (c) $\frac{1}{2}$ (AB – CD) (d) $\frac{1}{2}$ (AB + CD)

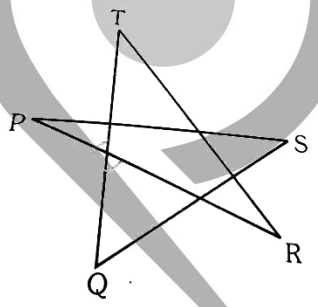
18. The ratio of the measure of an angle of a regular octagon to the measure of its exterior angle is:

(a) 3 : 1 (b) 2 : 1 (c) 1 : 3 (d) 1 : 2

19. The difference between an exterior angle of (n – 1) sided regular polygon and an exterior angle of (n + 2) sided regular polygon is 6°, then the value of "n" is

(a) 14 (b) 15 (c) 13 (d) 12

20. Find ∠P + ∠Q + ∠R + ∠S + ∠T.



(a) 90° (b) 60° (c) 45° (d) 180°

21. Two regular polygons are such that the ratio between their number of sides is 1 : 2 and the ratio of measures of their interior angles is 3 : 4. The number of sides of each polygon is:

(a) 5, 10 (b) 6, 12 (c) 4, 8 (d) 2, 3

ANSWER KEY

EXERCISE – 1

1. 36°,72°,108°,144°
4. 36^0, 60^0, 108^0 and 156^0
6. No
7. trapezium
14. ∠DCE = 60°
15. 37°, 143°, 37°, 143°
16. 108°, 72°, 108°, 72°
17. 68°, 112°, 68°, 112°
18. 4.5 cm
19. ∠A = 45°, ∠B = 135°
20. ∠B = 110°, ∠C = 70°, ∠D = 110°
21. ∠CDB = 45°, ∠ADB = 60°
26. (i) F (ii) T (iii) F (iv) F (v) T (vi) F (vii) T
27. x =65°, y = 25°
30. x = 40°, y= 50°
31. ∠AOB = 90°
32. ∠DBC = 50°
40. 12 cm
41. (i) 12 cm (ii) 13.5 cm^2
42. 6 cm, 7 cm, 5 cm
46. 12 cm
48. (i) 12 cm (ii) 13.5 cm^2
49. 6 cm, 7 cm, 5 cm

EXERCISE – 2

12. 50°, 60°, 70°
13. 51 cm
14. 12 cm, 13.5 cm^2
15. 6 cm, 7 cm, 5 cm

EXERCISE – 3

Ques.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Ans.	c	d	c	c	c	b	c	a	d	d
Ques.	11.	12.	13	14.	15.	16.	17.	18.	19.	20.
Ans.	a	b	c	c	c	c	c	c	b	d
Ques.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
Ans.	c	d	b	d	a	c	b	c	c	c
Ques.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.
Ans.	c	c	c	a	a	a	b	c	c	d
Ques.	41.	42.	43.	44.	45.	46.	47.	48.	49.	50.
Ans.	d	d	c	a	c	d	a	a	c	d
Ques.	51.	52.	53.	54.	55.	56.	57.	58.	59.	60.
Ans.	a	b	c	c	c	b	b	d	c	d
Ques.	61.	62.	63.	64.	65.	66.	67.	68.	69.	70.
Ans.	b	a	d	d	d	c	b	b	c	b
Ques.	71.	72.	73.							
Ans.	c	b	b							

EXERCISE – 4

Ques.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Ans.	c	b	d	d	d	a	c	c	d	c
Ques.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
Ans.	d	c	b	b	d	b	c	a	c	d
Ques.	21.									
Ans.	a									