DEVESH TEDIA CLASSES

Above muthoot finance bank, awadhpuri, bhopal

D.T.CLASSES

Class 09 - Mathematics

Section A

1. In $\triangle ABC$, EF is the line segment joining the mid-points of the sides AB and AC. BC = 7.2 cm, Find EF. **[1]**

   a) 3.6 cm
   b) 2.6 cm
   c) 3.5 cm
   d) 3.4 cm

2. If a diagonal AC and BD of a quadrilateral ABCD bisect each other, then ABCD is a **[1]**

   a) Parallelogram
   b) Triangle
   c) Rectangle
   d) Rhombus

3. Given Rectangle ABCD and P, Q, R and S are the mid-points of the sides AB, BC, CD and DA respectively. If length of a diagonal of Rectangle is 8 cm, then the quadrilateral PQRS is a **[1]**

   a) Rectangle with one side 4 cm
   b) Square with each side 4 cm
   c) Rhombus with each side 4 cm
   d) Parallelogram with one side 4 cm

4. ABCD is a parallelogram and E and F are the centroids of triangles ABD and BCD respectively, then EF = **[1]**

   a) DE
   b) CE
   c) AE
   d) BE

5. Diagonals of a Parallelogram ABCD intersect at O. If $\angle BOC = 90^\circ$, $\angle BDC = 50^\circ$ then $\angle OAB$ is **[1]**

   a) 90°
   b) 40°
   c) 50°
   d) 10°

6. If one angle of a parallelogram is 24^o less than twice the smallest angle, then the measure of the largest angle of the parallelogram is **[1]**

   a) 112^o
   b) 176^o
   c) 102^o
   d) 68^o

7. The figure formed by joining the mid-points of the sides of a quadrilateral ABCD, taken in order, is a square only if **[1]**

   a) Diagonals of ABCD are equal and perpendicular
   b) ABCD is a Rhombus
   c) Diagonals of ABCD are perpendicular
   d) Diagonals of ABCD are equal

8. ABCD is a Trapezium in which AB$\|$ DC and $\angle A = \angle B$ = 45^o. Find angles C and D of the **[1]**

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Trapezium

a) 135^o, 135^o b) 200^o, 50^o

c) 120^o, 120^o d) 150^o, 150^o

9. In $\triangle ABC$, $\angle A = 30^o$, $\angle B = 40^o$ and $\angle C = 110^o$. The angles of the triangle formed by joining the mid-points of the sides of this triangle are **[1]**

a) 60^o, 70^o, 50^o b) 60^o, 40^o, 80^o

c) 70^o, 70^o, 40^o d) 30^o, 40^o, 110^o

10. The figure forms by joining the mid-points of the sides of a Rhombus, taken in order are: **[1]**

a) A Triangle b) A Rhombus

c) A Parallelogram d) A Rectangle

11. ABCD is a Rectangle, diagonals AC and BD intersect each other at P. If $\angle APD = 52^o$, find $\angle ACB$ and $\angle DBA$. **[1]**

a) 25^o and 25^o b) 100^o and 260^o

c) 20^o and 120^o d) 64^o and 26^o

12. Opposite angles of a Quadrilateral ABCD are equal. If AB = 4cm, find the length of CD. **[1]**

a) 2 cm b) 5 cm

c) 4 cm d) 3 cm

13. The area of a quadrilateral whose diagonals measure 48 m and 32 m respectively and bisect each other at right angles is **[1]**

a) 768 m^2 b) 758 m^2

c) 742 m^2 d) 732 m^2

14. In Triangle ABC which 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. Find the length of BC? **[1]**

a) 15cm b) 13cm

c) 12cm d) 13.5cm

15. If bisectors of $\angle A$ and $\angle B$ of a quadrilateral ABCD intersect each other at P, of $\angle B$ and $\angle C$ at Q, of $\angle C$ and $\angle D$ at R and of $\angle D$ and $\angle A$ at S, then PQRS is a **[1]**

a) Quadrilateral whose opposite angles are supplementary b) Rhombus

c) Rectangle d) Parallelogram

16. The angle between two altitudes of a Parallelogram through the vertex of an obtuse angle of the Parallelogram of 60^o. Find the angles of the Parallelogram **[1]**

a) 150^o, 150^o, 30^o, 30^o b) 200^o, 100^o, 30^o, 30^o

c) 110^o, 50^o, 105^o, 105^o d) 120^o, 60^o, 120^o, 60^o

17. The figure formed by joining the mid-points of the adjacent sides of a rhombus is a **[1]**

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a) trapezium
b) Parallelogram

c) rectangle
d) square

18. The Diagonals AC and BD of a Parallelogram ABCD intersect each other at point O. If $\angle DAC = 32^\circ$ and $\angle AOB = 70^\circ$, then $\angle DBC$ is equal to **[1]**

a) 38°
b) 86°

c) 24°
d) 32°

19. D and E are the mid-points of the sides AB and AC of $\triangle$ABC and O is any point on the side BC, O is joined to A. If P and Q are the mid-points of OB and OC res, Then DEQP is **[1]**

a) A Parallelogram
b) A Rectangle

c) A Rhombus
d) A Triangle

20. The diagonals AC and BD of a parallelogram ABCD intersect each other at the point O. If $\angle DAC = 32^\circ$ and $\angle AOB = 70^\circ$ then, $\angle DBC$ is equal to **[1]**

a) 24°
b) 40°

c) 86°
d) 38°

21. In $\triangle$ABC, E is the mid-point of median AD such that BE produced meets AC at F. If AC = 10.5 cm, then AF = **[1]**

a) 5 cm
b) 2.5 cm

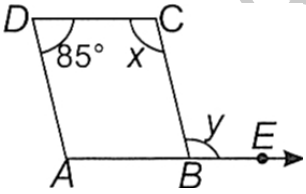
c) 3 cm
d) 3.5 cm

22. The lengths of the diagonals of a rhombus are 16 cm and 12 cm. The length of each side of the rhombus is **[1]**

a) 8 cm
b) 12 cm

c) 10 cm
d) 9 cm

23. ABCD is a parallelogram in which ∠ADC = 85° and side AB is produced to point E as shown in the figure. Find the value of (x + y). **[1]**



a) 85°
b) 95°

c) 190°
d) 160°

24. ABCD is a Parallelogram in which $\angle BAO = 35^\circ$, $\angle DAO = 40^\circ$ and $\angle COD = 105^\circ$. Find $\angle ABO$? **[1]**

a) 30°
b) 45°

c) 20°
d) 40°

25. The two diagonals are equal in a **[1]**

a) trapezium
b) rhombus

c) rectangle
d) parallelogram

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26. Diagonals of a quadrilateral ABCD bisect each other. If $\angle A = 45^o$, then $\angle B$ = **[1]**

a) 125^o b) 120^o

c) 135^o d) 115^o

27. In which of the following figures are the diagonals equal? **[1]**

a) Parallelogram b) Rhombus

c) Trapezium d) Rectangle

28. By using a given figure of quadrilateral ABCD, match the following: **[1]**

Column-I	Column-II
(a) If ABCD is a parallelogram, then sum of the angles x, y and z is	(i) 25°
(b) If ABCD is a rhombus, where $\angle D = 130°$, then the value of x is	(ii) 180°
(c) If ABCD is a rhombus, then value of w is	(iii) 50°
(d) If ABCD is a parallelogram, where x + y = 130°, then the value of $\angle B$ is	(iv) 90°

a) (a) - (iii), (b) - (i), (c) - (ii), (d) - (iv) b) (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv)

c) (a) - (ii), (b) - (i), (c) - (iv), (d) - (iii) d) (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii)

29. E Divides AB in the ratio 1 : 3 and also, F divides AC in the ratio 1 : 3. EF = 2.8 cm, Find BC **[1]**

a) 12 cm b) 11 cm

c) 11.2 cm d) 11.5 cm

30. What is the length of PQ in a trapezium ABCD in which AB||DC and P and Q are mid-points on AD and BC respectively? **[1]**

a) $\frac{1}{2}$(AB + CD) b) $\frac{1}{2}$ (AB + BD)

c) $\frac{1}{2}$CD d) $\frac{1}{2}$AB

31. D and E are the mid-points of the sides AB and AC, respectively of $\triangle$ABC. DE is produced to F. To prove that CF is equal and parallel to DA, we need an additional information which is **[1]**

a) $\angle DAE = \angle EFC$ b) AE = EF

c) DE = EF d) $\angle ADE = \angle ECF$

32. If the diagonals of a rhombus are 18 cm and 24 cm respectively, then its side is equal to **[1]**

a) 15 cm b) 17 cm

c) 20 cm d) 16 cm

33. If APB and CQD are 2 parallel lines, then the bisectors of the angles APQ, BPQ, CQP and PQD form, square only if **[1]**

a) Diagonals of ABCD are unequal b) ABCD is a parallelogram

c) Diagonals of ABCD are equal d) ABCD is a Rhombus

34. A diagonal of a Rectangle is inclined to one side of the rectangle at an angle of 25°. The Acute Angle between the diagonals is : **[1]**

a) 115° b) 25°

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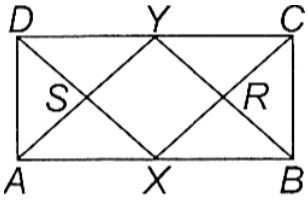
c) 40° d) 50°

35. X, Y are the mid-points of opposite sides AB and DC of a parallelogram ABCD. AY and DX are joined intersecting at S; CX and BY are joined intersecting at R. Then SXRY is a **[1]**



a) Square b) Rectangle

c) Parallelogram d) Rhombus

36. ABCD is a trapezium in which AB || DC. M and N are the mid-points of AD and BC respectively. If AB = 12 cm, MN = 14 cm, then CD = **[1]**

a) 16 cm b) 12 cm

c) 10 cm d) 14 cm

37. D and E are the mid-points of the sides AB and AC res. Of $\triangle ABC$. DE is produced to F. To prove that CF is equal and parallel to DA, we need an additional information which is: **[1]**

a) DE = EF b) $\angle DAE = \angle EFC$

c) AE = EF d) $\angle ADE = \angle ECF$

38. A diagonal of a rectangle is inclined to one side of the rectangle at 35^o. The acute angle between the diagonals is **[1]**

a) 70^o b) 50^o

c) 55^o d) 45^o

39. ABCD is a Rhombus such that $\angle ACB$= 40°, then $\angle ADB$ is **[1]**

a) 40° b) 50°

c) 60° d) 100°

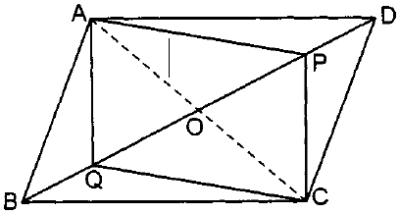
40. P is the mid-point of side BC of a parallelogram ABCD such that ∠BAP = ∠DAP. If AD = 10 cm, then CD = **[1]**

a) 5 cm b) 10 cm

c) 6 cm d) 8 cm

Section B

41. In Figure, ABCD is a parallelogram and P, Q are the points on the diagonal PD such that BQ = DP. Show what APCQ is a parallelogram. **[2]**



42. In the Figure, D is the mid-point of AB and PC = $\frac{1}{2}$ AP = 3 cm. If AD = DB = 4 cm and DE $\parallel$ BP. Find AE. **[2]**

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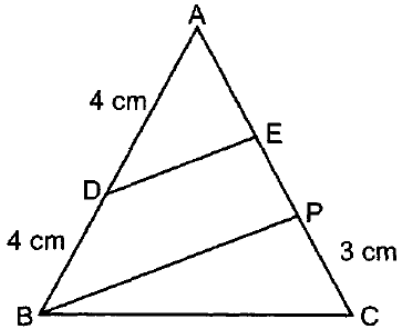
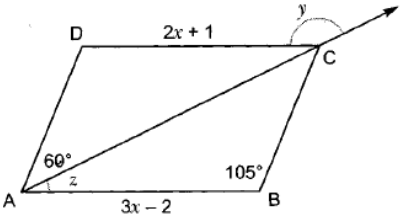
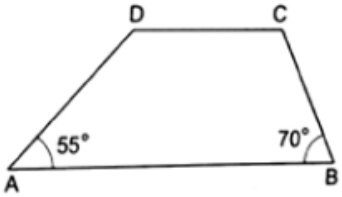


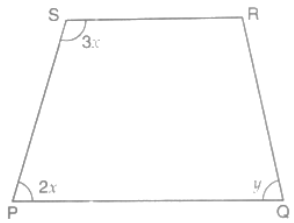
43. In Fig., ABCD is a parallelogram. Find the value of x, y, and z. **[2]**



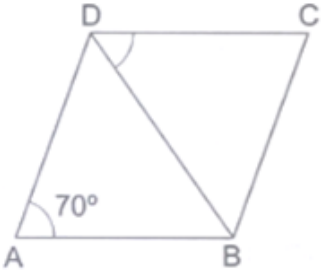
44. In the adjoining figure, ABCD is a trapezium in which $AB||CD$. If $\angle A = 55^\circ$ and $\angle B = 70^\circ$ find $\angle C$ and $\angle D$ **[2]**



45. In Fig., PQRS is an isosceles trapezium. Find x and y. **[2]**



46. In the adjoining figure, ABCD is a rhombus. If ∠A = 70°, find ∠CDB. **[2]**



47. If an angle of a parallelogram is four fifths of its adjacent angle, find the angles of the parallelogram. **[2]**

48. ABCD is a rectangle and P, Q, R and S are mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus. **[2]**

49. If the bisectors of two adjacent angles A and B of a quadrilateral ABCD intersect at a point O such that ∠C + ∠D = k ∠AOB, then find the value of k. **[2]**

50. In Fig., AB || DE, AB = DE, AC || DF and AC = DF. Prove that BC || EF and BC = EF. **[2]**

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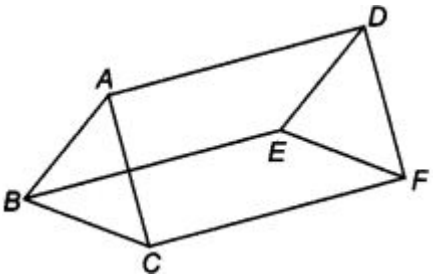
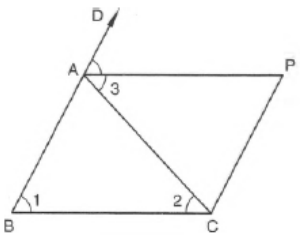


Section C

51. In the figure, ABC is an isosceles triangle in which AB = AC. CP || AB and AP is the bisector of exterior ∠CAD of △ABC. **[3]**

Prove that (i) ∠PAC = ∠BCA and (ii) ABCP is a parallelogram.



52. Prove that if each pair of a opposite angles of a quadrilateral is equal, then it is a parallelogram. **[3]**

53. ABCD is a quadrilateral in which AB || DC and AD = BC. Prove that ∠A = ∠B . **[3]**

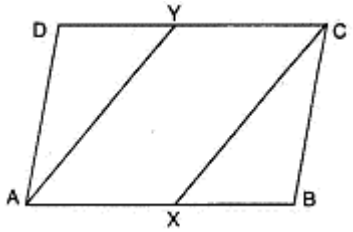
54. ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallel to BC intersects AC at D. Show that **[3]**

i. D is the mid-point of AC

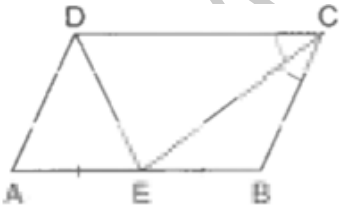
ii. MD ⊥ AC

iii. CM = MA = $\frac{1}{2}$AB

55. In the given figure, ABCD is a parallelogram and X, Y are the mid-points of the sides AB and DC respectively. Show that quadrilateral AXCY is a parallelogram. **[3]**



56. In the adjoining figure, ABCD is a parallelogram, E is the midpoint of AB and CE bisects ∠BCD. **[3]**



Prove that

i. AE = AD

ii. DE bisects ∠ADC and

iii. ∠DEC = 90^{o}.

57. In $\triangle ABC$, D, E and F are respectively the mid-points of sides AB, BC and CA. Show that $\triangle ABC$ is divided into four congruent triangles by joining D, E and F. **[3]**

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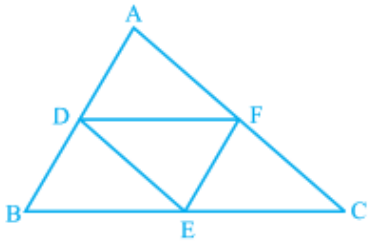


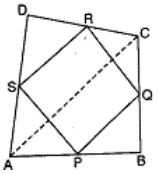
58. The angle between two altitudes of a parallelogram through the vertex of an obtuse angle of the parallelogram is 60°. Find the angles of the parallelogram. **[3]**

59. ABCD is a quadrilateral in which P, Q, R and S are mid-points of the sides AB, BC, CD and DA. AC is a diagonal. Show that **[3]**

i. SR || AC and SR = $\frac{1}{2}$AC

ii. PQ = SR

iii. PQRS is a parallelogram.

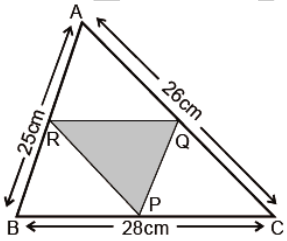


60. A diagonal of a parallelogram bisects one of its angles. Show that it is a rhombus. **[3]**

Section D

61. **Read the following text carefully and answer the questions that follow:** **[4]**

There is a Diwali celebration in the DPS school Janakpuri New Delhi. Girls are asked to prepare Rangoli in a triangular shape. They made a rangoli in the shape of triangle ABC. Dimensions of △ABC are 26 cm, 28 cm, 25 cm.



i. In fig R and Q are mid-points of AB and AC respectively. Find the length of RQ. (1)

ii. Find the length of Garland which is to be placed along the side of △QPR. (1)

iii. R, P and Q are the mid-points of AB, BC, and AC respectively. Then find the relation between area of △PQR and area of △ABC. (2)

OR

R, P, Q are the mid-points of corresponding sides AB, BC, CA in ΔABC, then name the figure so obtained BPQR. (2)

62. **Read the following text carefully and answer the questions that follow:** **[4]**

Harish makes a poster in the shape of a parallelogram on the topic SAVE ELECTRICITY for an

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inter-school competition as shown in the follow figure.

i. If $\angle A = (4x + 3)^o$ and $\angle D = (5x - 3)^o$, then find the measure of $\angle B$. (1)

ii. If $\angle B = (2y)^o$ and $\angle D = (3y - 6)^o$, then find the value of y. (1)

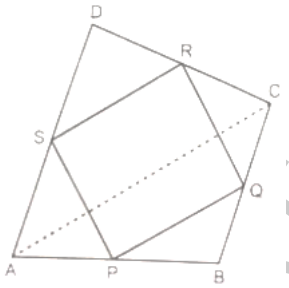
iii. If $\angle A = (2x - 3)^o$ and $\angle C = (4y + 2)^o$, then find how x and y relate. (2)

OR

If AB = (2y - 3) and CD = 5 cm then what is the value of y? (2)

63. **Read the following text carefully and answer the questions that follow:** **[4]**

Modern curricula include several problem-solving strategies. Teachers model the process, and students work independently to copy it. Sheela Maths teacher of class 9^{th} wants to explain the properties of parallelograms in a creative way, so she gave students colored paper in the shape of a quadrilateral and then ask the students to make a parallelogram from it by using paper folding.



i. How can a parallelogram be formed by using paper folding? (1)

ii. If $\angle RSP = 30^o$, then find $\angle RQP$. (1)

iii. If $\angle RSP = 50^o$, then find $\angle SPQ$? (2)

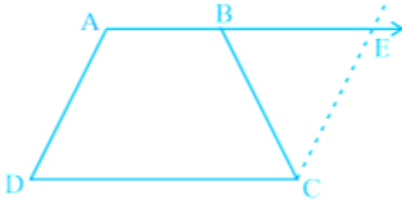
OR

If SP = 3 cm, Find the RQ. (2)

Section E

64. P, Q, R and S are respectively the mid-points of sides AB, BC, CD and DA of quadrilateral ABCD in which AC = BD and AC $\perp$ BD. Prove that PQRS is a square **[5]**

65. ABCD is a trapezium in which AB || CD and AD = BC. **[5]**



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Show that :

i. $\angle A = \angle B$

ii. $\angle C = \angle D$

iii. $\triangle ABC \cong \angle BAD$

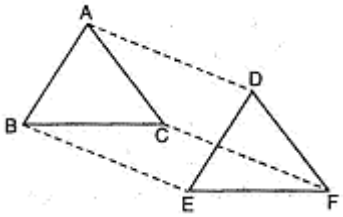
iv. diagonal AC = diagonal BD

66. Prove that the diagonal divides a parallelogram into two congruent triangles. **[5]**

67. Show that if the diagonals of a quadrilateral are equal and bisect each other at right angles, then it is a square. **[5]**

68. ABCD is rhombus and AB is produced to E and F such that AE = AB = BF. Prove that ED and FC are perpendicular to each other. **[5]**

69. In $\triangle ABC$ and $\triangle DEF$, AB = DE, AB || DE, BC = EF and BC || EF. Vertices A, B and C are joined to vertices D, E and F respectively. **[5]**



Show that:

i. Quadrilateral ABED is a parallelogram

ii. Quadrilateral BECF is a parallelogram

iii. AD || CF and AD = CF

iv. quadrilateral ACFD is a parallelogram

v. AC = DF

vi. $\triangle ABC \cong \triangle DEF$.

70. PQRS is a parallelogram. PX and QY are respectively, the perpendiculars from P and Q to SR and RS produced. Prove that PX = QY. **[5]**

71. Show that the quadrilateral formed by joining the mid-points of the consecutive sides of a square is also a square. **[5]**

72. Prove that the quadrilateral formed by the bisectors of the angles of a parallelogram is a rectangle. **[5]**

73. In a quadrilateral ABCD, the line segments bisecting $\angle C$ and $\angle D$ meet at E. Prove that $\angle A + \angle B = 2\angle CED$. **[5]**

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