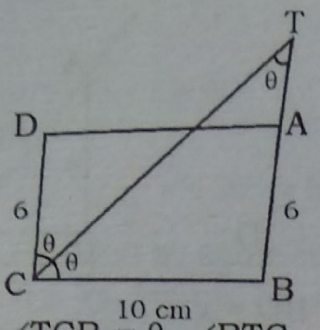
$$x + y = \frac{227°}{2}$$

$$= \frac{360° - 227°}{2} = \frac{133°}{2} = 66.5°$$

94. (B)



Let $\angle TCB = \theta$, $\angle BTC = \theta$

So, AB || CD So, BT || CD

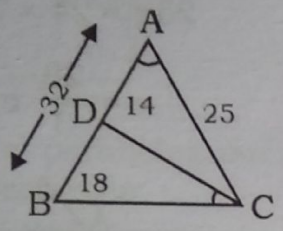
$\angle TCB = \angle BTC$

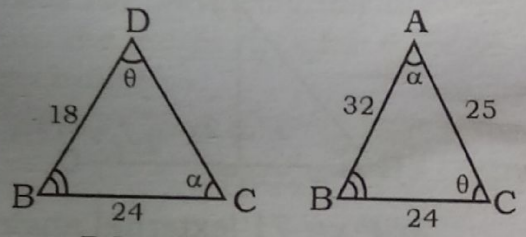
$BT = BC$

$AT + AB = BC$

$AT = 10 - 6 = 4$ cm.

95. (A)





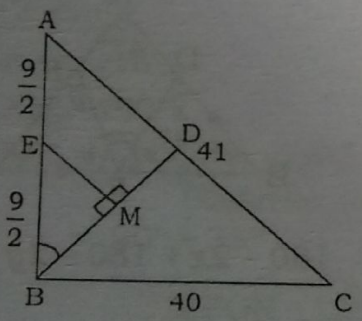
$$\frac{BC}{AB} = \frac{BD}{BC} \Rightarrow \frac{BC}{32} = \frac{18}{BC}$$

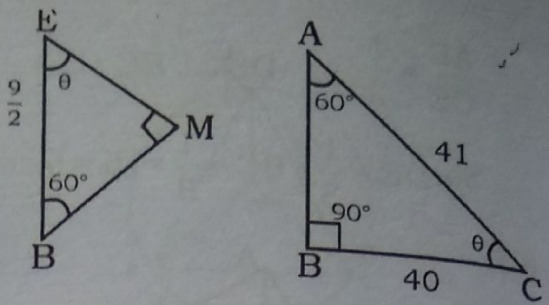
$$BC^2 = 576$$

$$BC = 24$$

$$\frac{BD}{BC} = \frac{18}{24} = \frac{3}{4}$$

96. (D)

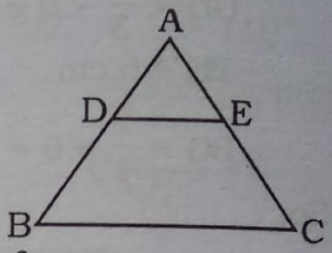




$$\frac{EM}{40} = \frac{EB}{AC} \Rightarrow \frac{EM}{40} = \frac{9}{2 \times 41}$$

$$\Rightarrow \quad EM = \frac{180}{41}$$

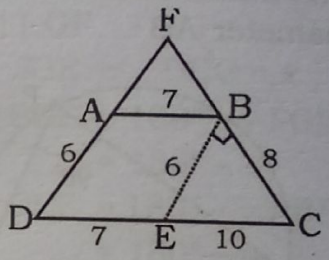
Property



Therefore

$$\frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC} \text{ and } \frac{AD}{DB} = \frac{AE}{EC}$$

97. (C)



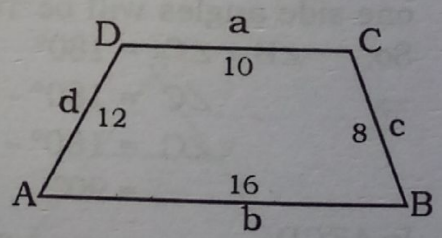
$\therefore$ In Δ BCE, EC = 10, BC = 8, BE = 6

$\therefore$ It is a right angle triangle.

$\angle B = 90° \Rightarrow \angle F = 90°$

- Angle formed by two parallel line on a single line are equal.

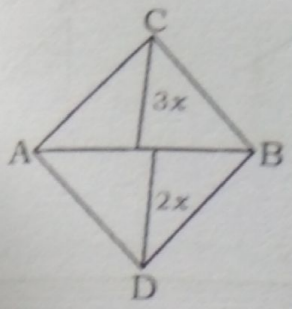
98. (C)



- $AC^2 + BD^2 = c^2 + d^2 + 2 \times a \times b$

$= 144 + 64 + 2 \times 10 \times 16$

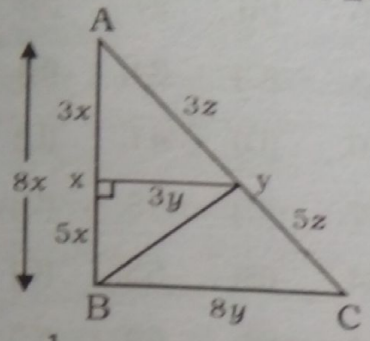
$= 208 + 320 = 528$



$$\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta ABD} = \frac{\frac{1}{2} \times AB \times 3x}{\frac{1}{2} \times AB \times 2x}$$

$$= 3 : 2$$

99. (B)

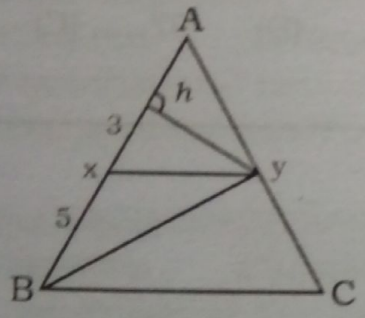


$$= \frac{1}{2} \times 8x \times 8y = 16$$

$$\Rightarrow xy = \frac{1}{2}$$

Area of ΔBXY

$$= \frac{1}{2} \times 5x \times 3y = \frac{15}{2} \times \frac{1}{2} = 3.75$$



$$\frac{\text{Area of } \Delta AXY}{\text{Area of } \Delta ABC} = \left(\frac{3}{8}\right)^2$$

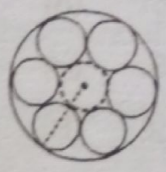
$$\text{Area of } \Delta AXY = \frac{9}{64} \times 16 = \frac{9}{4}$$

$$\frac{\text{Area of } \Delta BXY}{\text{Area of } \Delta AXY} = \frac{\frac{1}{2} \times BX \times h}{\frac{1}{2} \times AX \times h}$$

$$= \frac{BX}{AX}$$

$$\text{Area of } \Delta BXY = \frac{5}{13} \times \frac{9}{4} = 3.75$$

100. (D)



r = radius of small circle

R = radius of large circle

Draw a seventh circle in centre which is symmetrial to other.

$\therefore R = 2r + r$

$R = 3r$

$$\therefore r = \frac{R}{3} = \frac{32}{3}$$

Answers-key

1.	(C)	2.	(C)	3.	(B)	4.	(D)	5.	(B)	6.	(C)	7.	(C)
8.	(B)	9.	(C)	10.	(C)	11.	(A)	12.	(A)	13.	(B)	14.	(C)
15.	(A)	16.	(B)	17.	(C)	18.	(A)	19.	(B)	20.	(D)	21.	(B)
22.	(C)	23.	(C)	24.	(C)	25.	(D)	26.	(A)	27.	(A)	28.	(C)
29.	(A)	30.	(B)	31.	(D)	32.	(A)	33.	(C)	34.	(B)	35.	(B)
36.	(D)	37.	(D)	38.	(B)	39.	(B)	40.	(D)	41.	(D)	42.	(B)
43.	(D)	44.	(C)	45.	(B)	46.	(A)	47.	(C)	48.	(C)	49.	(A)
50.	(D)	51.	(B)	52.	(B)	53.	(C)	54.	(B)	55.	(C)	56.	(D)
57.	(D)	58.	(A)	59.	(A)	60.	(D)	61.	(B)	62.	(C)	63.	(C)
64.	(A)	65.	(B)	66.	(C)	67.	(C)	68.	(C)	69.	(A)	70.	(C)
71.	(B)	72.	(B)	73.	(D)	74.	(D)	75.	(D)	76.	(B)	77.	(A)
78.	(A)	79.	(B)	80.	(B)	81.	(C)	82.	(B)	83.	(D)	84.	(A)
85.	(A)	86.	(D)	87.	(D)	88.	(C)	89.	(C)	90.	(B)	91.	(A)
92.	(A)	93.	(A)	94.	(B)	95.	(A)	96.	(D)	97.	(C)	98.	(C)
99.	(B)	100.	(D)										

EXERCISE

1. If the diagonals of a quadrilateral bisect each other, then quadrilateral -
(A) Kite (B) Parallelogram
(C) Trapezium (D) None of these

2. In a quadrilateral A,B,C and D are in the ratio 1 : 2 : 3 : 4, then quadrilateral-
(A) Parallelogram (B) Rectangle
(C) Rhombus (D) Trapezium

3. The figure formed by joining the mid-points of the pairs of consecutive sides of a quadrilateral is -
(A) Parallelogram (B) Rectangle
(C) Rhombus (D) Square

4. The quadrilateral formed by joining the mid-points of consecutive sides of a parallelogram is -
(A) Parallelogram (B) Rectangle
(C) Rhombus (D) Square

5. The quadrilateral formed by joining the mid-points of sides of a rectangle is -
(A) Parallelogram (B) Rectangle
(C) Rhombus (D) Square

6. The quadrilateral formed by joining the mid-points of the sides of rhombus is -
(A) Parallelogram (B) Rectangle
(C) Rhombus (D) Square

7. The quadrilateral formed by joining the mid-points of sides of square is -
(A) Parallelogram (B) Rectangle
(C) Rhombus (D) Square

8. In a parallelogram PQRS, PO and QO are the bisectors of $\angle P$ and $\angle Q$, then angle POQ is-
(A) 90° (B) 120°
(C) 45° (D) 100°

9. In a quadrilateral ABCD, AO and BO are the bisectors of $\angle A$ and $\angle B$, then $\angle AOB$ is -
(A) $\frac{1}{2}(\angle A + \angle C)$ (B) $\frac{1}{2}(\angle C + \angle D)$
(C) $\frac{1}{2}(\angle C + \angle B)$ (D) $\frac{1}{2}(\angle A + \angle D)$

10. The bisectors of angle P and angle R of quadrilateral PQRS meet SR and QP produced of A and B. If $\angle SPQ = 60°$ and $\angle QRS = 100°$ then sum of $\angle A$ and $\angle B$ is -
(A) 160° (B) 80°
(C) 180° (D) 40°

11. The angle bisectors of a parallelogram forms a —
(A) Parallelogram (B) Rhombus
(C) Rectangle (D) Trapezium

12. AE and CF are perpendiculars to the diagonal BD of a parallelogram ABCD, then
(A) AE = CF (B) AE ≠ CF
(C) AE = $\frac{1}{2}$ CF (D) CF = $\frac{1}{2}$ AE

13. ABCD is a parallelogram, AO and BO are the angle bisectors of angle A and angle B. Line POQ is draw parallel to AB, then
(A) AP = BQ (B) AP ≠ BQ
(C) AP = $\frac{1}{2}$ BQ (D) BQ = $\frac{1}{2}$ AP

14. If the length of the side PQ of the rhombus PQRS is 6 cm and $\angle PQR = 120°$, then the length of QS is -
(A) 3 cm (B) 4 cm
(C) 5 cm (D) 6 cm

15. The perimeter of a rhombus is 146 cm and one of its diagonals is 5.5 cm. The other diagonal is -
(A) 24 cm (B) 48 cm
(C) 26 cm (D) 52 cm

16. One of the diagonals of a rhombus is double the other diagonal. The area is 25 cm^2. The sum of diagonals is :
(A) 10 cm (B) 12 cm
(C) 15 cm (D) 18 cm

17. The length of a sides of a rhombus is 10 cm and one of its diagonal diagonal is 12 m. The length of the other diagonal is :
(A) 10 cm (B) 16 cm
(C) 12 cm (D) 8 cm

18. Diagonals of a parallelogram are 8 cm and 6 cm. If one of side is 5 cm, then the area of parallelogram.
(A) 24 cm^2 (B) 48 cm^2
(C) 12 cm^2 (D) 36 cm^2

19. PQRS is a cyclic rhombus. The $\angle R$ is equal to :
(A) 30° (B) 60°
(C) 45° (D) 90°

20. The diagonals of a parallelogram PQRS intersect at O. A line through O intersects PQ at X and SR at Y then OX : OY is -
(A) 1 : 2 (B) 2 : 1
(C) 1 : 1 (D) 1 : 3

21. In a parallelogram ABCD, $\angle ABC = 120°$. If the bisectors AO and BO of angles $\angle A$ and $\angle B$, meet at O on CD, then CO : DO is
(A) 1 : 2 (B) 2 : 1
(C) 1 : 1 (D) 1 : 3

22. In a quadrilateral ABCD, BE and DF angle bisectors of $\angle ABC$ and $\angle ADC$. When AB produced meets DF at F and CD produced meets BE at E. If $\angle ABC = 40°$ and $\angle ADC = 50°$ then find the sum of $\angle E$ and $\angle F$.
(A) 45° (B) 60°
(C) 75 (D) 90°

23. ABCD is a parallelogram. AB is produced to E so that BE = AB and intersect BC at P, then BP : PC
(A) 1 : 2 (B) 2 : 1
(C) 1 : 1 (D) 1 : 3

24. ABCD is a parallelogram and E is the mid-point of side BC. if DE and AB when produced meet at F, then AF : AB is
(A) 1 : 2 (B) 2 : 1
(C) 1 : 1 (D) 1 : 3

25. If ABCD is a quadrilateral in which AB || CD and AD = BC. If $\angle A = 60°$ then find $\angle B$
(A) 60° (B) 120°
(C) 90° (D) 30°

26. In a triangle ABC median AD is produced to E such that AD = DE, then quadrilateral ABEC is
(A) Rhombus (B) Rectangle
(C) Parallelogram (D) Square

27. ABCD is a parallelogram and P and Q are points on the diagonal BD such that DP = BQ, then AP : CQ is -
(A) 1 : 1 (B) 1 : 2
(C) 2 : 1 (D) 1 : 3

28. The diagonals of a rectangle PQRS meet at O. If $\angle OQR = 66°$ then find $\angle OPS$.
(A) 66° (B) 33°
(C) 57° (D) 45°

29. ABCD is a parallelogram. E and F are the mid-points of the sides AB and CD. Diagonals BD intersect EC and AF at P and Q then BP : PQ : QD is -
(A) 1 : 1 : 1 (B) 1 : 2 : 1
(C) 1 : 1 : 2 (D) 2 : 1 : 1

30. Parallelogram ABCD and rectangle ABEF have the same base AB and also have equal areas. If the perimeter of pallelogram and rectangle P and R, then-
(A) P = R (B) P > R
(C) P < R (D) P ⩽ R

31. If an exterior angle of a cyclic quadrilateral be 50°, then the interior opposite angle is -
(A) 50° (B) 40°
(C) 90° (D) 130°

32. ABCD is a parallelogram, BD is diagonal, $\angle BAD = 50°$ and $\angle DBC = 45°$, then $\angle BDC$ is —
(A) 50° (B) 40°
(C) 90° (D) 130°

33. ABCD is a parallelogram, $\angle DAB = 30°$ BC = 20 cm and AB = 15 cm. Find the area of a parallelogram.
(A) 150 cm^2 (B) 200 cm^2
(C) 400 cm^2 (D) 300 cm^2

34. A cyclic quadrilateral ABCD is such that AB = BC. AD = DC, AC ⊥ BD, $\angle CAD = a°$, Find $\angle ABC$ = ?
(A) a (B) $\frac{a}{2}$
(C) 2a (D) 4 a

35. ABCD is a cyclic quadrilateral, AB is a diameter of the circle. If $\angle ACD = 50°$, the value of $\angle BAD$ is -
(A) 60° (B) 12 50°
(C) 40° (D) 30°

36. The diagonals AC and BD of a cyclic quadrilateral ABCD intersect each other at point P, then -
(A) AP. BP = CB.DP
(B) AP.CD = AB.CP
(C) BP.AB = CD.CP
(D) AP.CP = BP.DP

37. A, B, C, D are four points on a circle, AC and BD intersect at a point E such that $\angle BEC = 130°$ and $\angle ECD = 20°$ then $\angle BAC$ is-
(A) 100° (B) 110°
(C) 120° (D) 90°

38. The area of a trapezium is 105 cm^2 and the length of its parallel sides are 9 cm and 12 cm, then the height of the trapezium is -
(A) 5 cm (B) 10 cm
(C) 12 cm (D) 15 cm

39. ABCD is a trapezium, such that AB = CD and AD | | BC, AD = 5 cm, BC = 9 cm. If area of ABCD is 35 cm^2 then CD is -
(A) $\sqrt{29}$ cm (B) $\sqrt{21}$ cm
(C) $\sqrt{39}$ cm (D) $\sqrt{31}$ cm

40. OABC is a rhombus whose three vertices A, B and C lie on a circle of radius 10 cm and with centre O. Find the area of the rhombus.
(A) $5\sqrt{3}$ cm^2 (B) $50\sqrt{3}$ cm^2
(C) $25\sqrt{3}$ (D) $\frac{25}{\sqrt{3}}$ cm^2

41. Two parallelograms on equal bases and between the same parallels. The ratio of their areas is :-
(A) 1 : 1 (B) 1 : $\sqrt{2}$
(C) 1 : 2 (D) 2 : 1

42. A square and a rhombus have the same base and rhombus is inclined at 30°. What is the ratio of area of the square to the area of the rhombus.
(A) $\sqrt{2}$: 1 (B) 1 : $\sqrt{2}$
(C) 1 : 2 (D) 2 : 1

43. ABCD is a cyclic quadrilateral. Sides AB and DC, when produced meet at the point P and sides AD and BC, when produced meet at the point Q. If $\angle ADC = 85°$ and $\angle BPC = 40°$, then $\angle CQD$ is equal to :-
(A) 85° (B) 40°
(C) 30° (D) 55°

44. ABCD is a square, M is the mid-point of AB and N is the mid-point of BC, DM and AN are joined and they meet at O then which of the following is correct ?
(A) OA : OM = 1 : 2
(B) AN = MD
(C) $\angle ADM = \angle ANB$
(D) $\angle AMD = \angle BAN$

45. The length of the diagonal BD of the parallelogram ABCD is 12 cm. If P and Q are the centroid of the ΔABC and ΔADC respectively, then the length of the line segment PQ is -
(A) 4 cm (B) 6 cm
(C) 9 cm (D) 8 cm

46. In a quadrilateral ABCD, with unequal sides, if the diagonals AC and BD intersect at right angles, then
(A) $AB^2 + BC^2 = CD^2 + CA^2$
(B) $AB^2 + CD^2 = BC^2 + DA^2$
(C) $AB^2 + AD^2 = BC^2 + CD^2$
(D) $AB^2 + BC^2 = 2(CD^2 + DA^2)$

47. A parallelogram ABCD has sides AB = 24 cm and AD = 16 cm. The distance between the sides AB and DC is 10 cm. Find the distance between the sides AD and BC.
(A) 16 cm (B) 18 cm
(C) 15 cm (D) 26 cm

48. ABCD is a rhombus. A straight line through C cuts AD Produced at P and AB produced at Q. If $DP = \frac{1}{2}AB$, then the ratio of the lengths of BQ and AB is -
(A) 2 : 1 (B) 1 : 2
(C) 1 : 1 (D) 3 : 1

49. The ratio of the angles $\angle A$ and $\angle B$ of non-square rhombus ABCD is 4 : 5 , then the value of $\angle C$ is -
(A) 50° (B) 45°
(C) 80° (D) 95°

50. ABCD is a quadrilateral that angle D = 90° A circle touches the sides AB, BC, CD and DA at P, Q, R and S respectively If BC = 45 cm, CD = 25 cm and BP = 27 cm. Find the radius of circle.
(A) 7 cm (B) 14 cm
(C) 13 cm (D) 11 cm

51. Find the area of a trapezium ABCD in which AB | | DC, AB = 26 cm, BC = 25 cm, CD = 40 and DA = 25 cm.
(A) 648 cm^2 (B) 792 cm^2
(C) 692 cm^2 (D) 892 cm^2

52. In the trapezium ABCD, BE $\perp$ AD, CF $\perp$ AD $\angle BAE = 30°$ and angle CDF = 45°, BC = 6 cm and AB = 12 cm. Find the area of trapezium.
(A) $18(3+\sqrt{3})$ cm^2
(B) $36\sqrt{3}$ cm^2
(C) $12(3+2\sqrt{3})$ cm^2
(D) $12(3+\sqrt{3})$ cm^2

53. ABCD is a quadrilateral in which diagonal BD = 64 cm AL $\perp$ BD and CM $\perp$ BD, such that AL = 13.2 cm and CM = 16.8 cm. The area of the quadrilateral ABCD is -
(A) 690 cm^2 (B) 960 cm^2
(C) 860 cm^2 (D) 1060 cm^2

54. ABCD is a square. E is a point inside the square such that ΔBCE is an equilateral triangle. Find the value of AED?
(A) 60° (B) 90°
(C) 120° (D) 150°

55. If the sides of a quadrilateral ABCD touch a circle and AB = 6 cm, CD = 5 cm, BC = 7 cm, the length of AD is -
(A) 4 cm (B) 6 cm
(C) 8 cm (D) 9 cm

56. ABCD is a cyclic quadrilateral. AB and DC are produced to meet at P. If $\angle ADC = 70°$ and $\angle DAB = 60°$, then the sum of $\angle PBC$ and $\angle PCB$ is -
(A) 130° (B) 150°
(C) 155° (D) 180°

57. If PQRS be a rectangle and A, B, C and D are the mid-points of $\overline{PQ}$, $\overline{QR}$, $\overline{RS}$ and $\overline{SA}$, then the area of quadrilateral PQRS is equal to:
(A) Area (ABCD) (B) $\frac{1}{3}$ Area (ABCD)
(C) $\frac{3}{4}$ Area (ABCD) (D) $\frac{1}{2}$ Area (ABCD)

58. A man standing in one corner of a square football field observes that the angle subtended by a pole in corner just diagonally opposite to man is 60°. If he travels 80 m opposite to pole in the same straight line angle becomes 30°. The length of the filed is —
(A) 20 m (B) 40 m
(C) $20\sqrt{2}$ m (D) $40\sqrt{2}$

59. ABCD is a rhombus. AB is produced to F and BA is produced to E such AB = AE = BF. When ED and FC produced meet at G, then find the ∠EGF
(A) 45°. (B) 60°
(C) 90° (D) 120°

60. ABCD is a rhombus. AB is produced to F and BA is produced to E such that AB = AE =BF, then
(A) ED > CF (B) ED ⊥ CF
(C) $ED^2 + CF^2 = EF^2$ (D) ED || CF

61. In a quadrilateral ABCD, OA and OB the angle bisectors of ∠DAB and ∠CBA. IF ∠ADC = 70 and ∠BCD = 80° then find AOB
(A) 70° (B) 80°
(C) 90° (D) 75°

62. The equations of X-axis is -
(A) $y = 0$ (B) $x = 0$
(C) $x = b$ (D) $y = a$

63. The coordinates of origin point is -
(A) (0, 0) (B) (0, 7)
(C) (*b*, 0) (D) (*a*, *b*)

64. Find the intercepts made by the line $3x + 4y - 12 = 0$ on the axes:
(A) 2 and 3 (B) 4 and 3
(C) 3 and 5 (D) None of these

65. Area of triangle formed by the graph of the line $2x - 3y + 6 = 0$ along with the coordinate axis is -
(A) $\frac{3}{2}$ sq. unit (B) 3 sq. unit
(C) 6 sq. unit (D) $\frac{1}{2}$ sq. unit

66. The radius of the circumcircle of the triangle made by x- axis, y-axis and $4x + 3y = 12$ is-
(A) 2 unit (B) 2.5 unit
(C) 3 unit (D) 4 unit

67. The graph of the equation $2x + 3y = 6$
(A) Intersects X-axis but not Y-axis
(B) Intersects Y-axis but not X-axis
(C) Passes through the origin
(D) Intersects each of X-axis and Y-axis

68. The sides of ΔABC are 6 cm, 8 cm and 10 cm , then the area of the triangle formed by its medians is :
(A) 18 cm^2 (B) 12 cm^2
(C) 15 cm^2 (D) 9 cm^2

69. Find the slope of the line joining the points (7, 5) and (9, 7)
(A) $\frac{1}{2}$ (B) 2
(C) 1 (D) 3

70. Find the equation of the line through the points (-1, -2) and (-5, 2).
(A) $2x + y = 3$ (B) $3x + 2y + 7 = 0$
(C) $x + y + 3 = 0$ (D) None of these

71. Find the equation of the straight line which passes through the point of intersection of the straight lines $x + y = 8$ and $3x - 2y + 1 = 0$ and is parallel to the straight line joining the points (3, 4) and (5, 6)
(A) $x - y + 2 = 0$ (B) $x + y - 2 = 0$
(C) $3x + 4y + 8 = 0$ (D) None of these

72. Find the equation of the line which passes through the point of intersection of line $2x - y + 5 = 0$ and $5x - 3y - 4 = 0$ and is perpendicular to the line $x - 3y + 21 = 0$.
(A) $2x + y + 8 = 0$ (B) $3x + 4y - 7 = 0$
(C) $3x + y = 0$ (D) None of these

73. The lines $3x + 4y = 7$ and $Kx + 8y = 14$ are parallel line. Find the value of K.
(A) 3 (B) 4
(C) 5 (D) 6

74. The triangle formed by joining the mid-points of the sides of the triangle whose vertices are (0, 1), (2, 1) and (0, 3). Find the ratio of area of the original triangle to the area of the formed triangle
(A) 1 : 4 (B) 4 : 1
(C) 1 : 2 (D) 2 : 1

75. Find the coordinates of the centroid of a triangle whose vertices are (0, 6), (8, 12) and (8, 0)
(A) $\left(\frac{16}{3}, 6\right)$ (B) $\left(6, \frac{16}{3}\right)$
(C) (6, 5) (D) (6, 3)

76. The vertices of a triangle are (3,-5) and (–7, 4). If its centroid (2,-12), then the third vertex.
(A) (10, –35) (B) (–2, 10)
(C) (10, 35) (D) (–3, 10)

77. Find the distance between two parallel lines $5x + 12y - 30 = 0$ and $5x + 12y - 4 = 0$.
(A) 3 unit (B) 2 unit
(C) 5 unit (D) 4 unit

78. If the distance between the points (0, –5) and (x, 0) is 13 unit, then the value of x is
(A) 10 (B) 12
(C) 14 (D) 13

79. If the vertices of a triangle ABC be (4, 3), (7, –1), (9, 3) then the triangles is-
(A) Scalene (B) Isosceles
(C) Equilateral (D) None of these

80. A (–2, –1), B (1, 0), C (4, 3) and D (1, 2) are the four points of a quadrilateral. The quadrilateral is -
(A) Square (B) Rhombus
(C) Parallelogram (D) None of these

81. If AD, BE and CF are medians of ΔABC, then
(A) $(AD + BE + CF) > \frac{1}{2}(AB + BC + CA)$
(B) $(AD + BE + CF) < \frac{1}{2}(AB + BC + CA)$
(C) $(AD + BE + CF) = \frac{1}{2}(AB + BC + CA)$
(D) $(AD + BE + CF) = \frac{1}{2}(AB + BC + CA)$

82. If the vertices of a triangle are A (6, 6), B (2,3) and C (4, 7), then the centroid of triangle is -
(A) (6, 6) (B) (4, 7)
(C) (2, 3) (D) $\left(4, \frac{16}{3}\right)$

83. Three point A(1, -2), B (3, 4) and C (4, 7) form:
(A) A straight line
(B) An equilateral triangle
(C) A right angled
(D) Acute angled

84. In what ratio does the X-axis divide the line segment joining the points (2, –3) and (5, 6).
(A) 1 : 4 (B) 2 : 1
(C) 2 : 3 (D) 3 : 2

85. A point P is 25 cm from the centre. The length of the tangent drawn from P to the circle is 24 cm. Find the radius of the circle.
(A) 5 cm (B) 7 cm
(C) 6 cm (D) 8 cm

86. All the sides BC, CA and AB of a ΔABC touch a circle at D,E and F respectively. AF + BD + CE is equal to:

(A) $\frac{1}{2}$ (Perimeter of ΔABC)

(B) $\frac{1}{3}$ (Perimeter of ΔABC)

(C) $\frac{1}{4}$ (Perimeter of ΔABC)

(D) Perimeter of ΔABC

87. A circle touches all the four sides of a quadrilateral ABCD. Then
(A) BC + DA = AB + CD
(B) AB + BC = CD + AD
(C) ABCD is a rectangle
(D) ABCD is square

88. Two circles of radii 10 cm and 8 cm touch externally Find the distance between their centres:
(A) 18 cm (B) 2 cm
(C) 9 cm (D) 15 cm

89. Two circles of radii 15 cm and 9 cm touch internally. Find the distance between their centres:
(A) 10 cm (B) 6cm
(C) 24 cm (D) 9 cm

90. Three circles touch each other externally, The distance between their centre is 4 cm, 6 cm and 8 cm. Find the radii of the circles-
(A) 2 cm, 4cm, 6 cm
(B) 1 cm, 3 cm, 5 cm
(C) 2cm, 3 cm, 4 cm
(D) 4 cm, 6cm, 8 cm

91. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Then $\angle PTQ$ is equal to
(A) $\angle OPQ$ (B) $2\angle OPQ$
(C) $\frac{1}{2}\angle OPQ$ (D) $\frac{1}{3}\angle OPQ$

92. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length of TP.
(A) $\frac{10}{3}$ cm (B) $\frac{20}{3}$ cm
(C) $\frac{40}{3}$ cm (D) $\frac{50}{3}$ cm

93. A circle inscribed in a ΔABC having sides 8 cm, 10 cm and 12 cm. A circle touches the sides AB, BC and CA at D,E and F. Find the length of AD
(A) 5 cm (B) 6 cm
(C) 4 cm (D) 10 cm

94. O is the centre of the circle. PA and PB are tangents of circle. Then the quadrilateral AOBP is :
(A) Rectangle (B) Square
(C) Cyclic (D) Trapezium

95. The radii of two concentric circles are 13 cm and 8 cm. AB is a diameter of the bigger circle. BD is a tangent of the smaller circle touching at D. Find the length AD.
(A) 16 cm (B) 19 cm
(C) 22 cm (D) 29 cm

96. In two concentric circles, AB and CD are two chords of the outer circle which touch th inner circle at E and F. then-
(A) AB = CD (B) AB $\neq$ CD
(C) AB = $\frac{1}{2}$CD (D) CD = $\frac{1}{2}$AB

97. If all sides of a parallelogram touch a circle, then the parallelogram is:
(A) Rhombus (B) Rectangles
(C) Trapezium (D) None of these

98. The length of a chord of a circle is equal to the radius of the circle. The angle which this chord subtends in the major segment of the circle is equal to:
(A) 30° (B) 45°
(C) 60° (D) 120°

99. Two circles touch each other internally. Their radii are 2 cm and 3 cm. The biggest chord of the greater circle which is outside the inner circle is of length

(A) $2\sqrt{2}$ cm (B) $3\sqrt{2}$ cm

(C) $4\sqrt{2}$ cm (D) $8\sqrt{2}$ cm

100. From a point A which is at a distance of 13 cm from centre O of a circle of radius 5 cm, in the same plane, a pair of tangents AB and AC are dawn to the circle .Area of quadrilateral ABOC is -

(A) 30 cm^2 (B) 60 cm^2

(C) 90 cm^2 (D) 120 cm^2

101. In a ΔABC, points D, E and F are the mid-points of the sides BC, AC and AB. Points P, Q and R are the mid-points of EF, FD and DE, then the ratio of area of ΔQRP and ΔAFE is :

(A) 1 : 4 (B) 1 : 2

(C) 1 : 8 (D) 1 : 12

102. ABCD is a cyclic trapezium with AB||DC and AB is diameter of the circle. If $\angle CAB = 30°$ then $\angle ADC$ is -

(A) 30° (B) 60°

(C) 120° (D) 150°

103. Each of the two circles of same radius r passes through the centre of the other. If the circles cut each other at the points C and D and A, B be their centres, the area of the quadrilateral CADB is -

(A) $\frac{1}{2}r^2$ (B) $\frac{1}{4}r^2$

(C) r^2 (D) $\frac{\sqrt{3}}{2}r^2$

104. AB and CD are two parallel chords of a circle such that AB = 10 cm and CD = 24 cm. If the chords are on the opposite sides of the centre and distance between them is 17 cm, the radius of the circle.

(A) 10 cm (B) 13 cm

(C) 25 cm (D) 12 cm

105. A chord AB of a circle C_1 of radius $(\sqrt{3}+1)$ cm, touches a circle C_2 which is concentric to G. If the radius of C_2 is $(\sqrt{3}-1)$ cm then length of AB is -

(A) $4\sqrt{3}$ cm (B) $4\sqrt[4]{3}$ cm

(C) $2\sqrt[8]{3}$ cm (D) $4\sqrt[8]{3}$ cm

106. In a ΔABC, points D, E and F are the mid-points of the sides BC, AC and AB. Points P, Q and R are the mid-points of EF, FD and DE, then the ratio of area of ΔPRE and ΔBDQ is :

(A) 1 : 4 (B) 1 : 2

(C) 1 : 3 (D) 1 : 8

107. AB is a diameter of the circle, CD is a chord equal to the radius of the circle. AC and BD when extended intersect at a point E. Find the $\angle AEB$.

(A) 30° (B) 60°

(C) 45° (D) 90°

108. The chord of a circle subtends an angle 120° at its centre. The length of the chord is :

(A) $\frac{\sqrt{3}}{2}$ times of radius

(B) $2\sqrt{2}$ times of radius

(C) $\sqrt{3}$ times of radius

(D) None of these

109. A, B and C are the three points on a circle such that the angles subtended by the chords AB and AC at the centre O are 90° and 110° respectively $\angle BAC$ is equal to:

(A) 80° (B) 120°

(C) 160° (D) 60°

110. When two circles touch externally, then the number of common tangents are:

(A) 1 (B) 2

(C) 3 (D) 4

111. When two circles touch internally, then number of common tangents are:
(A) 1 (B) 2
(C) 3 (D) 4

112. When two circles intersects two points, then number of common tangents are:
(A) 1 (B) 2
(C) 3 (D) 4

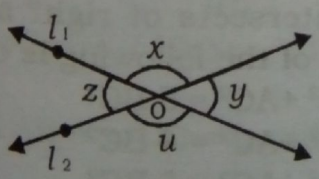
113. When two circles are not touching, then the number of common tangents are:
(A) 1 (B) 2
(C) 3 (D) 4

114. Three circles radii r_1, r_2 and r_3 touch each other externally. The area of the triangle formed by joining their centres is -
(A) $\sqrt{(r_1+r_2+r_3)r_1r_2r_3}$
(B) $(r_1+r_2+r_3)\sqrt{r_1r_2+r_2r_3+r_3r_1}$
(C) $(r_1r_2+r_2r_3+r_3r_1)$
(D) $r_1r_2r_3$

115. Two circles with centres P and Q intersect at B and C. A and D are points on the circles with centre C_1 and C_2 respectively such that A, C, D are collinear. If $\angle APB = 130°$ and $\angle BQD = \theta$, then the value of θ is -
(A) 60° (B) 65°
(C) 130° (D) 260°

116. AB is the diameter of a circle with centre O and radius OD is perpendicular to AB. If C is any point on minor arc BD, then find the $\angle BAD$.
(A) 60° (B) 45°
(C) 30° (D) 75°

117. In figure if $x = 45$, find the value of y.



(A) 145° (B) 135°
(C) 185° (D) 175°

118. Two circles whose centres are A and B intersect at C. Through C a line passes parallel to AB intersecting the circles at D and E. DE is equal to-
(A) AB (B) 2 AB
(C) 3 AB (D) 4 AB

119. If the medians of a triangle are equal, then the triangle is :
(A) Right angled (B) Isosceles
(C) Equilateral (D) Scalene

120. The incentre of a triangle is determined by the :
(A) Medians
(B) Angle bisector
(C) Sides perpendicular bisector
(D) Altitudes (height)

121. In ΔABC, AC = 5 cm. Calculate the length of AE where DE || BC. Given that AD = 3 cm and BD = 7 cm :
(A) 2 cm (B) 1 cm
(C) 1.5 cm (D) 2.5 cm

122. Area of $\Delta ABC = 30\ cm^2$. D and E are the midpoint of BC and AB. Find area (ΔBDE)
(A) $10\ cm^2$ (B) $7.5\ cm^2$
(C) $15\ cm^2$ (D) $30\ cm^2$

123. In an equilateral triangle of side 2a, find the length of its altitude (height) :
(A) $2a\sqrt{3}$ (B) $a\sqrt{3}$
(C) $a\frac{\sqrt{3}}{2}$ (D) $4a\sqrt{3}$

124. In ΔABC, P and Q are the middle points of the sides AB and AC. R is a point on the segment PQ such that PR : RQ = 1 : 2.
If PR = 2 cm, then BC = ?
(A) 4 cm (B) 2 cm
(C) 12 cm (D) 6 cm

125. If O is the circum-centre of ΔABC and $\angle OBC = 35°$. Find $\angle BAC$:
(A) 55° (B) 110°
(C) 70° (D) 35°