KD EDUCATION ACADEMY [9582701166]

Time : 6 hour

STD 9 Maths

kd 90+ questions ch-8 Quadrilateral

Total Marks : 270

*** Choose the right answer from the given options. [1 Marks Each]** **[71]**

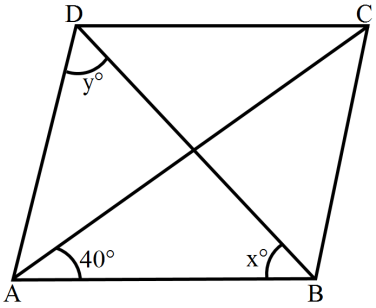
1. If the diagonals of a quadrilateral bisect each other at right angles then the figure is a:

   (A) Parallelogram (B) Rhombus (C) Trapezium (D) Rectangle

2. In Quadrilateral ABCD, $\angle A = (3x)^\circ,\ \angle B = (5x)^\circ,\ \angle C = (20x)^\circ,\ \angle D = (8x)^\circ$. Find the value of x?

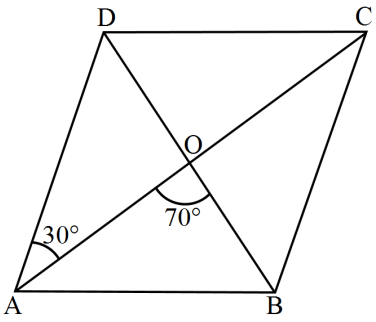
   (A) 11 (B) 10 (C) 20 (D) 9

3. In the given figure, ABCD is a Rhombus. Find the value of x and y?



   (A) x = 55º and y = 65º (B) x = 50º and y = 50º (C) x = 75º and y = 55º (D) x = 80º and y = 80º

4. The Diagonals AC and BD of a Parallelogram ABCD intersect each other at the point O such that $\angle DAC = 30^\circ$ and $\angle AOB = 30^\circ$. Then, $\angle DBC$?



   (A) 30º (B) 45º (C) 35º (D) 40º

5. PQRS is a quadrilateral. PR and QS intersect each other at O. in which of the following cases, PQRS is a parallelogram?

   (A) $\angle P = 100^\circ, \angle Q = 80^\circ, \angle R = 100^\circ$

   (B) $\angle P = 85^\circ, \angle Q = 85^\circ, \angle R = 95^\circ$

   (C) $PQ = 7cm, QR = 7cm, RS = 8cm, SP = 8cm$

   (D) $OP = 6.5cm, OQ = 6.5cm, OR = 5.2cm, OS = 5.2cm$

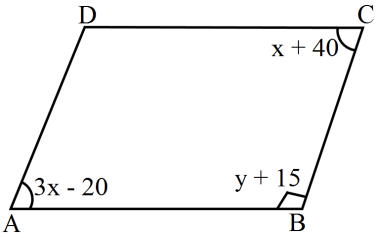
6. ABCD is a parallelogram, M is the mid-point of BD and BM bisects $\angle B$. Then, $\angle AMB =$

   (A) 45° (B) 60° (C) 90° (D) 75°

7. The Diagonals AC and BO of a Parallelogram ABCD intersect each other at point 0. If $\angle DAC = 32^\circ$ and $\angle AOB = 70^\circ$, then $\angle DBC$ is equal to:

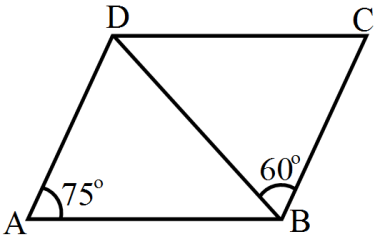
(A) 86º (B) 38º (C) 32º (D) 24º

8. In a parallelogram ABCD if $\angle A = (3x - 20),\ \angle B = (Y + 15),\ \angle C = (x + 40)$ then find the value of x and y?



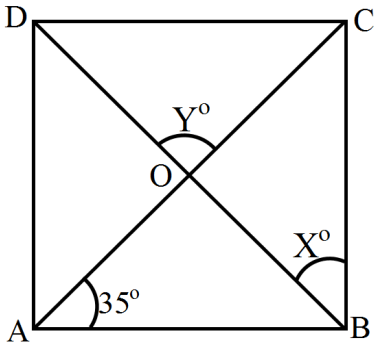
(A) x = 30º and y = 65º (B) x = 30º and y = 95º (C) x = 32º and y = 95º (D) x = 38º and y = 85º

9. 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°

10. In the figure, ABCD is a Rectangle. Find the values of x and y?



(A) x = 55º and y = 110º (B) x = 100º and y = 100º (C) x = 50º and y = 100º (D) x = 60º and y = 120º

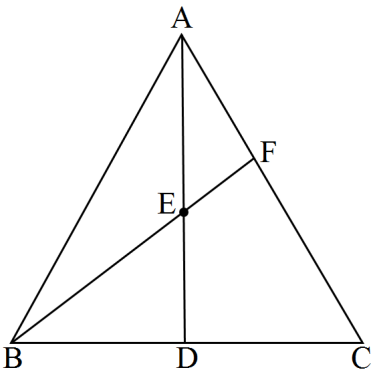
11. The parallel sides of a trapezium are a and b respectively. The line joining the mid-points of its non-parallel sides will be:

(A) $\frac{1}{2}(a - b)$ (B) $\frac{1}{2}(a + b)$ (C) $\frac{2ab}{(a + b)}$ (D) $\sqrt{ab}$

12. In a parallelogram ABCD, if $DAB = 75^\circ$ and $\angle DBC = 60^\circ$, then $\angle BDC = \ ?$

(A) 50º (B) 45º (C) 65º (D) 75º

13. In the given figure, AD is a median of $\triangle ABC$ and E is the midpoint of AD. If BE is joined and produced to meet AC in F then AF = ?



(A) $\frac{1}{3}AC$ (B) $\frac{3}{4}AC$ (C) $\frac{1}{2}AC$ (D) $\frac{2}{3}AC$

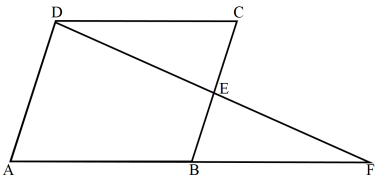
14. The area of a quadrilateral whose diagonals measure 48m and 32m respectively and bisect each other at right angles is:

(A) 742m^2 (B) 732m^2 (C) 758m^2 (D) 768m^2

15. In a quadrilateral ABCD, $\angle A + \angle C$ is 2 times $\angle B + \angle D$ If $\angle A = 140^\circ$ and $\angle D = 60^\circ$ then $\angle B =$

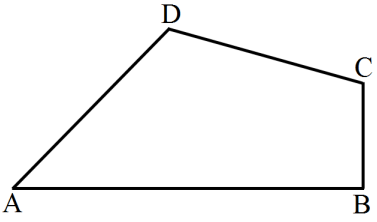
(A) 60° (B) 80° (C) 120° (D) None of these.

16. In given figure, ABCD is a parallelogram and E is the mid-point of BC. DE and AB when produced meet at F. Then, AF = ?



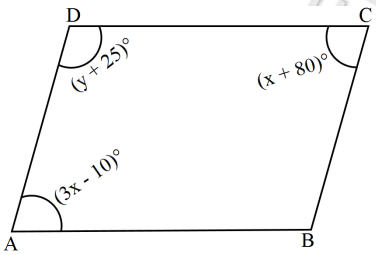
(A) AF = 2AB (B) $AF = \frac{3}{2}AB$ (C) AF = 3AB (D) AF^2 = 2AB^2

17. In Quadrilateral ABCD, $\angle A + \angle C = 140^\circ$, $\angle A : \angle C = 1 : 3$ and $\angle B : \angle D = 5 : 6$. Find the values of $\angle A$, $\angle B$, $\angle C$ and $\angle D$?



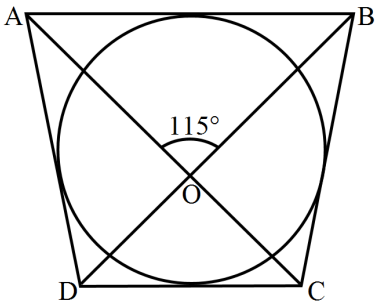
(A) 10º, 20º, 100º, 260º (B) 35º, 100º, 105º, 120º (C) 100º, 102º, 120º, 10º (D) 90º, 90º, 100º, 80º

18. In the fig, ABCD is a Parallelogram. The values of x and y are:



(A) 55º, 35º (B) 45º, 45º (C) 30º, 35º (D) 45º, 30º

19. In Fig. the quadrilateral ABCD circumscribes a circle with centre O. If $\angle AOB = 115^\circ$, then find $\angle COD = ?$

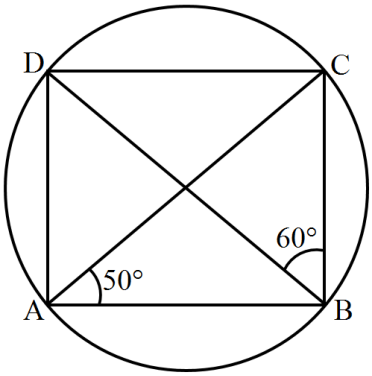


(A) 127º (B) 115º (C) 23º (D) 24º

20. 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°

21. In Fig. ABCD is a cyclic quadrilateral. If $\angle \mathrm{BAC} = 50^\circ$ and $\angle \mathrm{DBC} = 60^\circ$ then find $\angle \mathrm{BCD} = \ ?$



(A) 50º (B) 55º (C) 60º (D) 70º

22. The diagonals AC and BD of a parallelogram ABCD intersect each other at the point O. If $\angle \mathrm{DAC} = 32^\circ$ and $\angle \mathrm{AOB} = 70^\circ$ then, $\angle \mathrm{DBC}$ is equal to:

(A) 24º (B) 86º (C) 38º (D) 40º

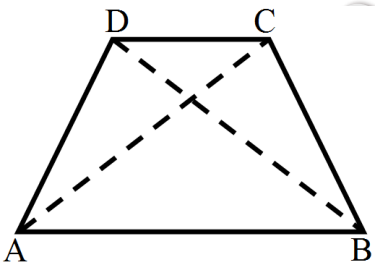
23. If the diagonals of a quadrilateral bisect each other at right angles, then the figure is a:

(A) Trapezium. (B) Parallelogram. (C) Rectangle. (D) Rhombus.

24. Two parallelograms stand on equal bases and between the same parallels. The ratio of their areas is:

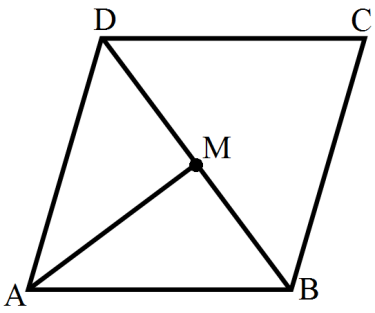
(A) 1 : 2 (B) 2 : 1 (C) 1 : 3 (D) 1 : 1

25. In a trapezium ABCD, if AB || CD, then $(AC^2 + BD^2) = ?$



(A) $BC^2 + AD^2 + 2BC \cdot AD$ (B) $AB^2 + CD^2 + 2AB \cdot CD$ (C) $AB^2 + CD^2 + 2AD \cdot BC$ (D) $BC^2 + AD^2 + 2AB \cdot CD$

26. In the given figure, ABCD is a parallelogram, M is the mid-point of BD and BD bisects $\angle \mathrm{B}$ as well as $\angle \mathrm{D}$. Then, $\angle \mathrm{AMB} = ?$



(A) 45° (B) 60° (C) 90° (D) 30°

27. In quadrilateral ABCD, if $\angle A = 60^\circ$ and $\angle B : \angle C : \angle D = 2 : 3 : 7$, then $\angle D$ is:

(A) 175º (B) 25º (C) 180º (D) 50º

28. If area of a Parallelogram with sides 'a' and 'b' is A and that of a rectangle with sides 'a' and 'b' is B, then

(A) None of these (B) A = B (C) A > B (D) A < B

29. In quadrilateral ABCD, if $\angle A = 60^\circ$ and $\angle B : \angle C : \angle D = 2 : 3 : 7,$ then $\angle D$ is:

(A) 175º (B) 180º (C) 25º (D) 50º

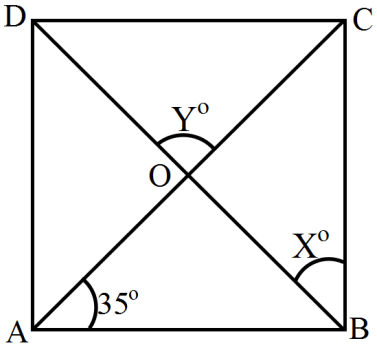
30. If angles A, B, C and D of the quadrilateral ABCD, taken in order, are in the ratio 3 : 7 : 6 : 4, then ABCD is a:

(A) Kite (B) Parallelogram (C) Trapezium (D) Rhombus

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

(A) 45º (B) 30º (C) 20º (D) 40º

32. In the figure, ABCD is a Rectangle. Find the values of x and y?



(A) x = 100º and y = 100º (B) x = 60º and y = 120º (C) x = 55º and y = 110º (D) x = 50º and y = 100º

33. If an angle of a parallelogram is two-third of its adjacent angle, the smallest angle of the parallelogram is:

(A) 108º (B) 81º (C) 54º (D) 72º

34. If one angle of a parallelogram is 24° less than twice the smallest angle, then the measure of the largest angle of the largest angle of the parallelogram is:

(A) 176° (B) 68° (C) 112° (D) 102°

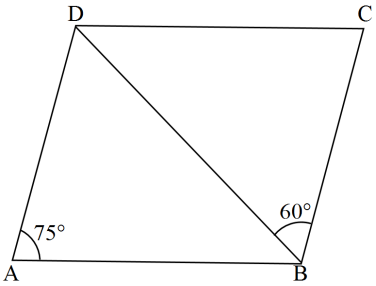
35. ABCD is a trapezium in which $AB \parallel DC$. M and N are the mid-points of AD and BC respectively. If AB = 12cm, MN = 14cm, then CD = ?

(A) 16cm (B) 12cm (C) 10cm (D) 14cm

36. The length of each side of a rhombus is 10cm and one if its diagonals is of length 16cm. The length of the other diagonal is:

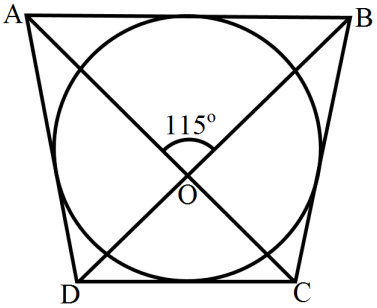
(A) 13cm (B) 12cm (C) $2\sqrt{39}\,\text{cm}$ (D) 6cm

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



(A) 45º (B) 75º (C) 50º (D) 60º

38. In Fig. the quadrilateral ABCD circumscribes a circle with centre O. If $\angle \text{AOB} = 115^\circ$, then find $\angle \text{COD}$.



(A) 23º (B) 24º (C) 127º (D) 115º

39. If one angle of a parallelogram is 24º less than twice the smallest angle, then the measure of the largest angle of the parallelogram is:

(A) 112º (B) 176º (C) 68º (D) 102º

40. ABCD is a Trapezium in which $\text{AB} \,||\, \text{DC}$ and $\angle \text{A} = \angle \text{B} = 45^\circ$. Find $\angle \text{C}$ and $\angle \text{D}$ of the Trapezium.

(A) 135º, 135º (B) 120º, 120º (C) 150º, 150º (D) 200º, 50º

41. Angles of a quadrilateral are in the ratio 3 : 4 : 4 : 7. Find all the angles of the quadrilateral.

(A) 60º, 120º, 80º, 140º (B) 70º, 70º, 100º, 100º (C) 60º, 80º, 80º, 140º (D) 60º, 80º, 100º, 90º

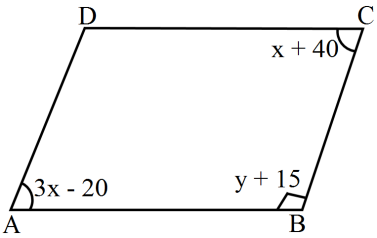
42. In Quadrilateral ABCD, $\angle \text{A} = 110^\circ,\ \angle \text{B} = 75^\circ$ and $\angle \text{C} = 35^\circ$. Find $\angle \text{D} = \ ?$

(A) 50º (B) 145º (C) 110º (D) 140º

43. Three angles of a quadrilateral are 80º, 95º and 112º. Its fourth angle is:

(A) 100° (B) 73º (C) 85º (D) 78º

44. In a parallelogram ABCD if angle A = (3x - 20), angle B = (Y + 15), angle C = (x + 40) then find the value of x and y?



(A) x = 38º and y = 85º | (B) x = 30º and y = 65º | (C) x = 32º and y = 95º | (D) x = 30º and y = 95º

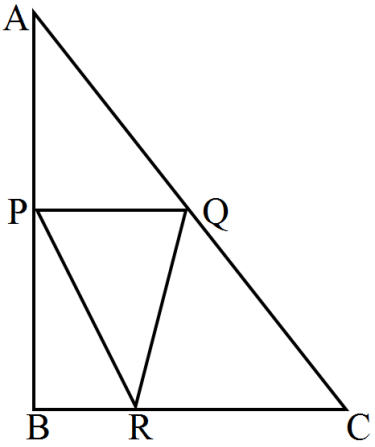
45. In a parallelogram ABCD, if $\angle DAB = 75^\circ$ and $\angle DBC = 60^\circ$, then $\angle BDC =$

(A) 75° | (B) 60° | (C) 45° | (D) 55°

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

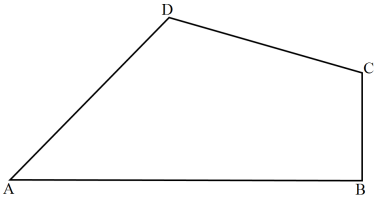
(A) 5cm | (B) 3cm | (C) 2.5cm | (D) 3.5cm

47. P, Q, R are the mid-points of AB, BC, AC res, If AB = 10cm, BC = 8cm, AC = 12cm, Find the perimeter of $\triangle PQR$.



(A) 15.5cm | (B) 14cm | (C) 15cm | (D) 13cm

48. In Quadrilateral ABCD, $\angle A + \angle C = 140^\circ$, $\angle A : \angle C = 1 : 3$ and $\angle B : \angle D = 5 : 6$. Find the values of $\angle A$, $\angle B$, $\angle C$ and $\angle D$?



(A) 35º, 100º, 105º, 120º | (B) 100º, 102º, 120º, 10º | (C) 10º, 20º, 100º, 260º | (D) 90º, 90º, 100º, 80º

49. Three angles of a quadrilateral are in the ratio 3 : 4 : 5 : 6. The smallest of these angles is:

(A) 60º | (B) 80º | (C) 45º | (D) 48º

50. Write the correct answer in the following:
ABCD is a rhombus such that $\angle ACB = 40^\circ$. then $\angle ADB$ is:

(A) 40º | (B) 45º | (C) 50º | (D) 60º

51. What is the length of PQ in a trapezium ABCD in which $AB \parallel DC$ and P and Q are mid-points on AD and BC respectively?

(A) $\frac{1}{2}(AB + BD)$ | (B) $\frac{1}{2}(AB + CD)$ | (C) $\frac{1}{2}AB$ | (D) $\frac{1}{2}CD$

52. The diagonals AC and BD of a rectangle ABCD intersect each other at P. If $\angle ABD = 50^\circ$, then $\angle DPC =$?

(A) 70º | (B) 100º | (C) 90º | (D) 80º

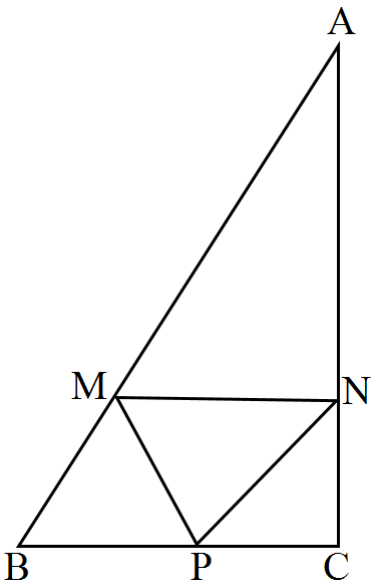
53. The length of each side of a rhombus is 10cm and one of its diagonal is of length 16cm. The Length of the other Diagonal is:

(A) 12cm (B) 13cm (C) 5cm (D) 6cm

54. In Quadrilateral $\angle A = 38^\circ,\ \angle C = 3\angle A,\ \angle D = 4\angle A$. Find the value of $\angle B = \ ?$

(A) 57º (B) 56º (C) 55º (D) 80º

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

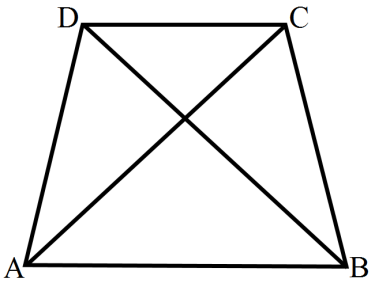


(A) 9cm, 8cm, 11cm (B) 2cm, 3cm, 11cm (C) 5cm, 6cm, 8cm (D) 5cm, 6cm, 7cm

56. In Parallelogram ABCD, bisectors of angles A and B intersect each other at O. The measure of $\angle AOB$ is:

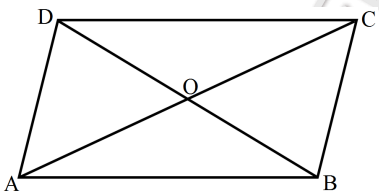
(A) 90º (B) 30º (C) 60º (D) 120º

57. In a Trapezium ABCD, if $AB \parallel CD$, then $(AC^2 + BD^2) =$?



(A) $BC^2 + AD^2 + 2BC \times AD$ (B) $AB^2 + CD^2 + 2AB \times CD$ (C) $AB^2 + CD^2 + 2AD \times BC$ (D) $BC^2 + AD^2 + 2AB \times CD$

58. In the given figure, ABCD is a Rhombus. Then,



(A) $(AC^2 + BD^2) = 3AB^2$ (B) $AC^2 + BD^2 = 4AB^2$ (C) $AC^2 + BD^2 = AB^2$ (D) $AC^2 + BD^2 = 2AB^2$

59. Write the correct answer in the following:

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

a. 24º
b. 86º
c. 38º
d. 32º

60. Write the correct answer in the following:
Three angles of a quadrilateral are 75º, 90º and 75º. The fourth angle is:
a. 90º
b. 95º
c. 105º
d. 120º

61. P is the mid-point of side BC of a parallelogram ABCD such that $\angle \mathrm{BAP} = \angle \mathrm{DAP}$. If AD = 10cm, then CD =
a. 5cm.
b. 6cm.
c. 8cm.
d. 10cm.

62. In a quadrilateral ABCD, $\angle \mathrm{A} + \angle \mathrm{C}$ is 2 times $\angle \mathrm{B} + \angle \mathrm{D}$ If $\angle \mathrm{A} = 140^\circ$ and $\angle \mathrm{D} = 60^\circ$ then $\angle \mathrm{B} =$
a. 60°
b. 80°
c. 120°
d. None of these.

63. The consecutive sides of a quadrilateral have:
a. No common point.
b. One common point.
c. Two common points.
d. Infinitely many common points.

64. 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°

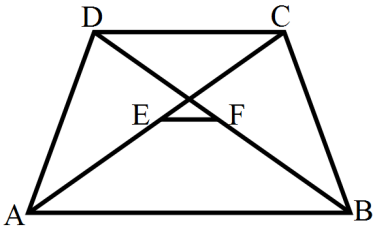
65. In a parallelogram ABCD, if $\angle \mathrm{DAB} = 75^\circ$ and $\angle \mathrm{DBC} = 60^\circ$, then $\angle \mathrm{BDC} =$
a. 75°
b. 60°
c. 45°
d. 55°

66. ABCD is a parallelogram and E is the mid-point of BC. DE and AB when produced meet at F. Then, AF =
a. $\frac{3}{2}\mathrm{AB}$
b. $2\mathrm{AB}$
c. $3\mathrm{AB}$
d. $\frac{5}{4}\mathrm{AB}$

67. The length of each side of a rhombus is 10cm and one if its diagonals is of length 16cm. The length of the other diagonal is:

a. 13cm
b. 12cm
c. $2\sqrt{39}\,\text{cm}$
d. 6cm

68. In a trapezium ABCD, if E and F be the mid-point of the diagonals AC and BD respectively. Then, EF = ?



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

69. The lengths of the diagonals of a rhombus are 16cm and 12cm. The length of each side of the rhombus is:
a. 10cm
b. 12cm
c. 9cm
d. 8cm

70. If ABCD is a parallelogram with two adjacent angles $\angle\text{A}=\angle\text{B}$ then the parallelogram is a:
a. Rhombus.
b. Trapezium.
c. Rectangle.
d. None of these.

71. In a quadrilateral ABCD, if AO and BO are the bisectors of $\angle\text{A}$ and $\angle\text{B}$ respectively, $\angle\text{C}=70^\circ$ and $\angle\text{D}=30^\circ$. Then, $\angle\text{AOB}=?$
a. 40°
b. 50°
c. 80°
d. 100°

*** A statement of Assertion (A) is followed by a statement of Reason (R). [5]**
Choose the correct option.

72. Assertion and Reason Type MCQ

Assertion: BCD is a quadrilateral in which P, Q, R and S are the mid-points of AB, BC, CD and DA respectively. Then, PQRS is a parallelogram.

Reason: The line segment joining the mid-points of any two sides of a triangle is parallel to the third side and equal to half of it.

a. Both Assertion (A) and Reason (R) are true and Reason is a correct explanation of Assertion (A).
b. Both Assertion (A) and Reason (R) are true but Reason is not a correct explanation of Assertio (A).

c. Assertion (A) is true and Reason (R) is false.
d. Assertion (A) is false and Reason (R) is true.

73. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following:

Assertion: A rectangle is 12cm long and 5cm tall, 34cm is its Perimeter?

Reason: Perimeter of rectangle = 2 × (leangth × breadth).

a. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
b. Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.
c. Assertion is true but the reason is false.
d. Both assertion and reason are false.

74. Assertion and Reason Type MCQ

Assertion: In a rhombus ABCD, the diagonal AC bisects $\angle \mathrm{A}$ as well as $\angle \mathrm{C}$.

Reason: The diagonals of a rhombus bisect each other at right angles.

a. Both Assertion (A) and Reason (R) are true and Reason is a correct explanation of Assertion (A).
b. Both Assertion (A) and Reason (R) are true but Reason is not a correct explanation of Assertio (A).
c. Assertion (A) is true and Reason (R) is false.
d. Assertion (A) is false and Reason (R) is true.

75. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following:

Assertion: A rectangle is 12cm wide, and 5cm tall, 13cm is the length of a diagonal.

Reason: A rectangle is 12cm wide, and 5cm tall, 13cm is the length of a diagonal.

a. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
b. Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.
c. Assertion is true but the reason is false.
d. Both assertion and reason are false.

76. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following:

Assertion: Kite is not rhombus.

Reason: Because only one adjacent pair of side are equal and only one pair of opposite angle are equal.

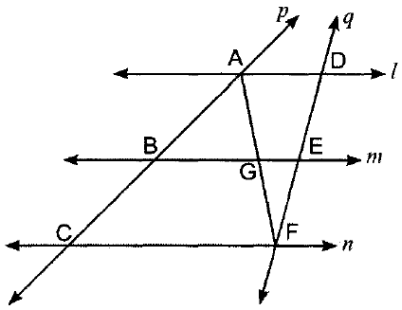
a. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
b. Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.
c. Assertion is true but the reason is false.
d. Both assertion and reason are false.

* Answer the following short questions. [2 Marks Each] [16]

77.

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.

78. l, m and n are three parallel lines intersected by transversal p and q such that l, m and n cut-off equal intercepts AB and BC on p Show that l, m and n cut-off equal intercepts DE and EF on q also.



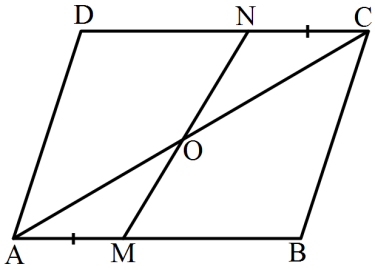
79. Diagonals of a quadrilateral ABCD bisect each other. If $\angle A = 35^\circ$ determine $\angle B$.

80. In ΔABC, BC = 8cm and CA = 7cm. If D and E are respectively the mid-points of AB and BC, determine the length of DE.

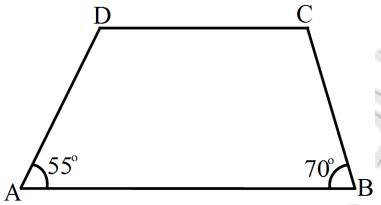
81. In a parallelogram ABCD, if $\angle B = 135^\circ$, determine the measure of its other angles.

82. The sides AB and CD of a parallelogram ABCD are bisected at E and F. prove that EBFD is a parellelogram.

83. In a parallelogram ABCD, points M and N have been taken on opposite sides AB and CD respectively such that AM = CN. Show that AC and MN bisect each other.

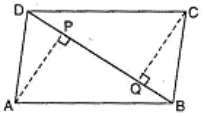


84. In the adjoining figure, ABCD is a trapezium in which AB || DC. If $\angle A = 55^\circ$ and $\angle B = 70^\circ$, find $\angle C$ and $\angle D$.



* Answer the following questions. [3 Marks Each] [36]

85. ABCD is a parallelogram and AP and CQ are perpendiculars from vertices A and C on diagonal BD respectively.



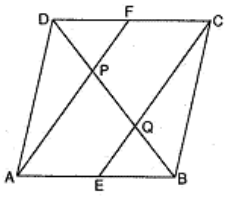
Show that :

i. $\triangle APB \cong \triangle CQD$

ii. AP = CQ.

86. ABCD is a trapezium in which AB || DC, BD is a diagonal and E is the mid-point of AD. A line is drawn through E parallel to AB intersecting BC at F. Show that F is the mid-point of BC.

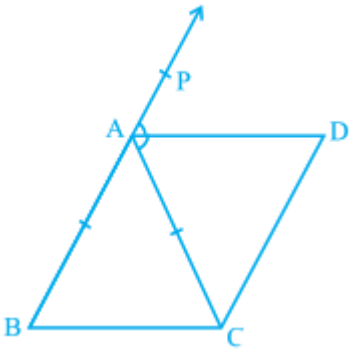
87. In a parallelogram ABCD, E and F are the mid-points of sides AB and CD respectively. Show that the line segments AF and EC trisect the diagonal BD.



88. In Figure ABC is an isosceles triangle in which AB = AC. AD bisects exterior angle PAC and CD || AB. Show that

i. $\angle DAC = \angle BCA$

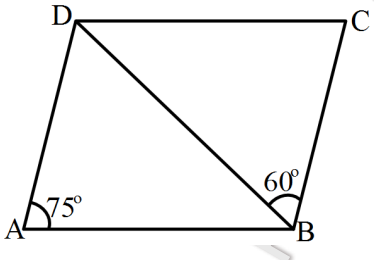
ii. ABCD is a parallelogram



89. ABCD is a trapezium in which AB || DC and $\angle A = \angle B = 45^\circ$. Find angles C and D of the trapezium.

90. Diagonals AC and BD of a parallelogram ABCD intersect each other at O. If OA = 3cm and OD = 2cm, determine the lengths of AC and BD.

91. In figure, ABCD is a parallelogram in which $\angle DAB = 75^\circ$ and $\angle DBC = 60^\circ$. Compute $\angle CDB$, and $\angle ADB$.



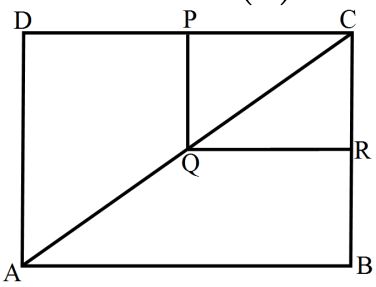
92. In a quadrilateral ABCD, the angles A, B, C and D are in the ratio of 1 : 2 : 4 : 5. Find the measure of each angles of the quadrilateral.

93. The perimeter of a parallelogram is 22cm. If the longer side measures 6.5cm, what is the measure of shorter side?

94. In figure, ABCD and PQRC are rectangles and Q is the mid-point of AC. Prove that

i. DP = PC

ii. $PR = \left(\frac{1}{2}\right)AC$



95. Find the measure of all the angles of a parallelogram, if one angle is 24° less than twice the smallest angle.

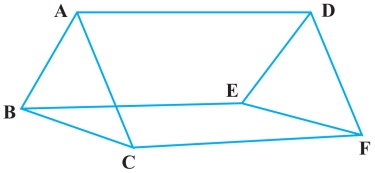
96. ABCD is a parallelogram in which AB = 9.5cm and its perimeter is 30cm. Find the length of each side of the parallelogram.

* Questions with calculation. [4 Marks Each] [72]

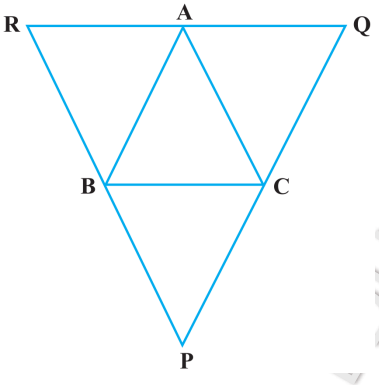
97. The angle between two altitudes of a parallelogram through the vertex of an obtuse angle of the parallelogram is 60º. Find the angles of the parallelogram.

98. A square is inscribed in an isosceles right triangle so that the square and the triangle have one angle common. Show that the vertex of the square opposite the vertex of the common angle bisects the hypotenuse.

99. AB || DE, AB = DE, AC || DF and AC = DF. Prove that BC || EF and BC = EF.

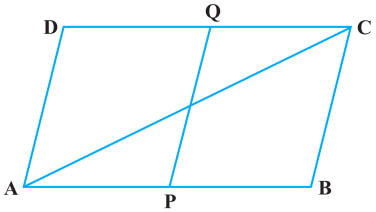


100. Through A, B and C, lines RQ, PR and QP have been drawn, respectively parallel to sides BC, CA and AB of a ΔABC as shown Show that $BC = \frac{1}{2}$ QR.



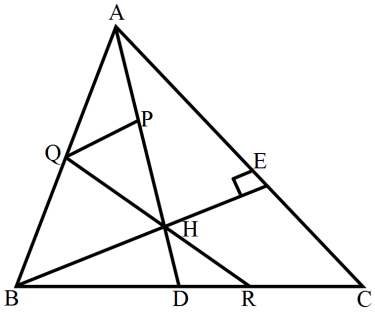
101. E is the mid-point of a median AD of ΔABC and BE is produced to meet AC at F. Show that $AF = \frac{1}{3}AC$.

102. Points P and Q have been taken on opposite sides AB and CD, respectively of a parallelogram ABCD such that AP = CQ Show that AC and PQ bisect each other.



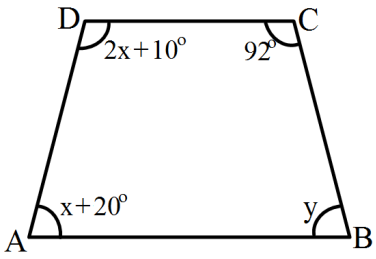
103. ABC is a Triangle. D is a point on Ab such that $AD = \frac{1}{4}AD$ and E is a point on AC such that $AE = \frac{1}{4}AC$. prove that $DE = \frac{1}{4}BC$.

104. 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 $\angle PQR = 90^\circ$.



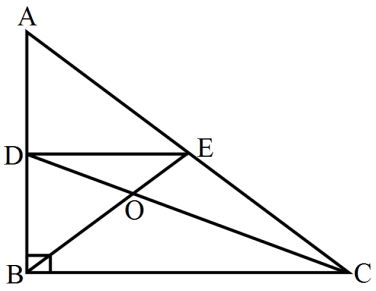
105. In a parallelogram ABCD, if $\angle A = (3x - 20)^\circ, \angle B = (y + 15)^\circ, \angle C = (x + 40)^\circ$, then find the values of x and y.

106. In the given figure, ABCD is a trapezium. Find the values of x and y.

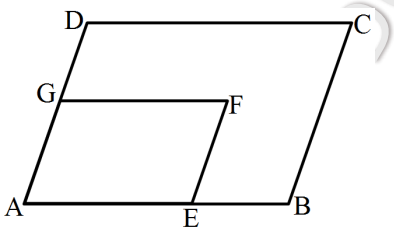


107. In figure, Triangle ABC is a right angled triangle at B. Given that AB = 9cm, AC = 15cm and D, E are the mid-points of the sides AB and AC respectively, calculate

i. The length of BC
ii. The area of $\triangle ADE$.

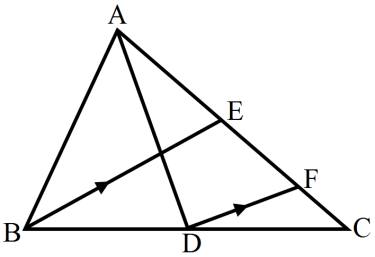


108. In the given figure, ABCD and AEFG are two parallelograms. If $\angle C = 58^\circ$, find $\angle F$.

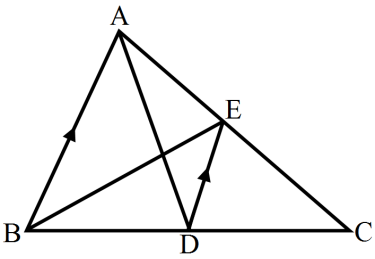


109. If ABCD is a rectangle with $\angle BAC = 32^\circ$, find the measure of $\angle DBC$.

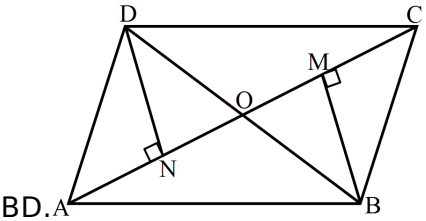
110. In the adjoining figure, AD and BE are the medians of $\triangle ABC$ and DF || BE. Show that $CF = \frac{1}{4}AC$.



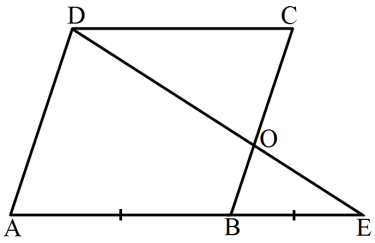
111. In the adjoining figure, AD is a median of $\triangle ABC$ and DE || BA. Show that BE is also a median of $\angle ABC$.



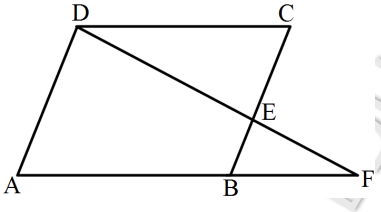
112. In the adjoining figure, $BM \perp AC$ and $DN \perp AC$. If BM = DN, prove that AC bisects BD.



113. In the adjoining figure, ABCD is a parallelogram in which AB is produced to E so that BE = AB. Prove that ED bisects BC.

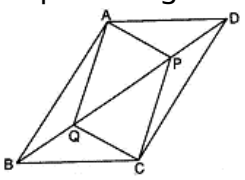


114. In the adjoining figure, ABCD is a parallelogram and E is the midpoint of side BC. If DEand AB when produced meet at F, prove that AF = 2AB.



*** Answer the following questions. [5 Marks Each]** **[50]**

115. In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ.

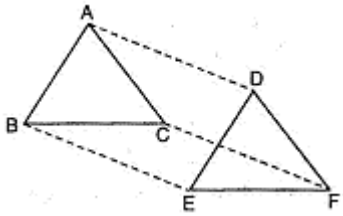


Show that

i. $\triangle APD \cong \triangle CQB$

ii. AP = CQ
iii. $\triangle AQB \cong \triangle CPD$
iv. AQ = CP
v. APCQ is a parallelogram.

116. 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.



Show that:

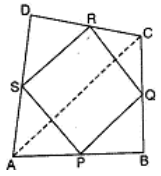
i. Quadrilateral ABED is a parallelogram
ii. Quadrilateral BECF is a parallelogram
iii. AD || CF and AD = CF
iv. quadrilateral ACFD is a parallelogram
v. AC = DF
vi. $\triangle ABC \cong \triangle DEF$.

117. ABCD is a trapezium in which AB || CD and AD = BC.
Show that :

i. $\angle A = \angle B$
ii. $\angle C = \angle D$
iii. $\triangle ABC \cong \angle BAD$
iv. diagonal AC = diagonal BD.

118. 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

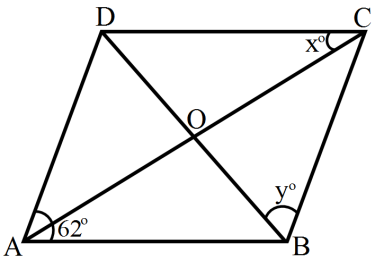
i. SR || AC and SR = $\frac{1}{2}$AC
ii. PQ = SR
iii. PQRS is a parallelogram.



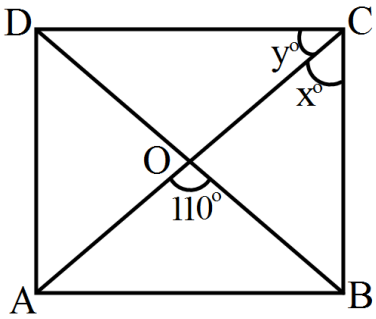
119. ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallels to BC intersects AC at D.Show that :

i. D is the mid-point of AC
ii. MD $\perp$ AC
iii. CM = MA = $\frac{1}{2}$AB

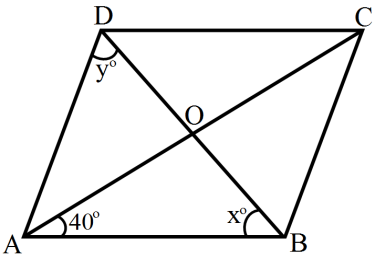
120. In each of the figures given below, ABCD is a rhombus. Find the value of x and y in each case.



121. In each of the figures given below, ABD is a rectangle. Find the values of x and y in each case.

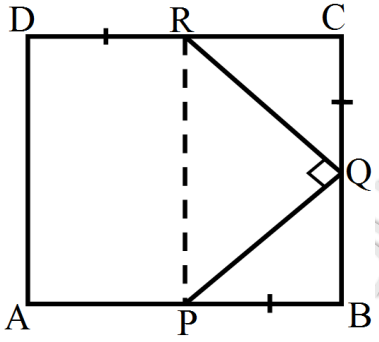


122. In each of the figures given below, ABCD is a rhombus. Find the value of x and y in each case.

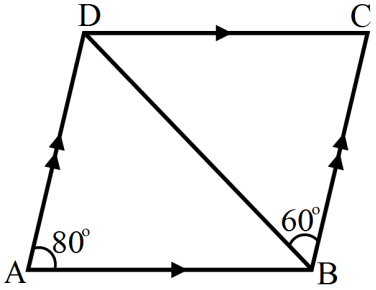


123. In the given figure, ABCD is a square and $\angle PQR = 90^\circ$. If PB = QC = DR, prove that:

i. QB = RC,
ii. PQ = QR,
iii. $\angle QPR = 45^\circ$



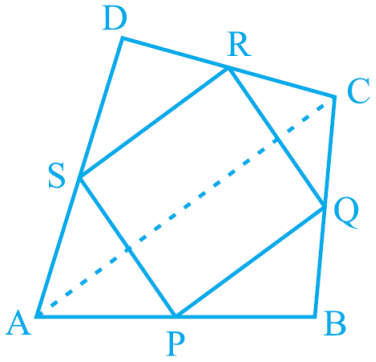
124. In the adjoining figure, ABCD is a parallelogram in which $\angle DAB = 80^\circ$ and $\angle DBC = 60^\circ$. Calculate $\angle CDB$ and $\angle ADB$.



* **Case study based questions.** **[20]**

125. Read the Source/ Text given below and answer these questions:

A class teacher gave students coloured paper in the shape of a quadrilateral. She asks him to make a parallelogram from it using paper folding.

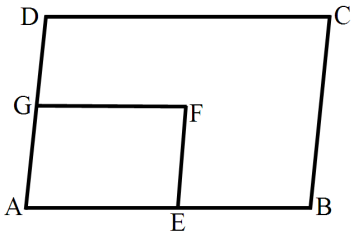


i. One angle of a quadrilateral is 108° and the remaining three angles are equal, then each of the three equal angles:
   a. 90°
   b. 74°
   c. 84°
   d. 72°

ii. How can a parallelogram be formed by using paper folding?
   1. By finding diagonals of the quadrilateral.
   2. By joining mid pts. of sides of a quadrilateral.
   3. By finding angle bisectors.
   4. None of these.

The quadrilateral formed by joining the mid-points of the sides of a quadrilateral PQRS, taken in order, is a rectangle, if:
   a. PQRS is a rectangle.
   b. PQRS is a parallelogram.
   c. diagonals of PQRS are perpendicular.
   d. diagonals of PQRS are equal.

iii. In the figure, ABCD and AEFG are two parallelograms. If $\angle C = 60^\circ$, then $\angle F$ is:



   a. 30°
   b. 60°
   c. 90°
   d. 120°

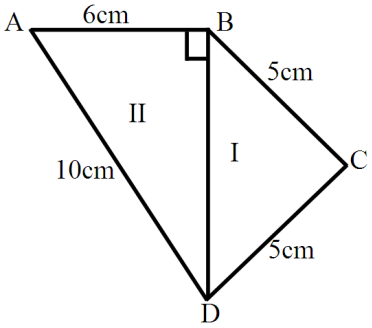
iv. Which of the following is not true for a parallelogram?

a. Opposite sides are equal.
b. Opposite angles are equal.
c. Opposite angles are bisected by the diagonals.
d. Diagonals bisect each other.

v. The angles of the quadrilateral are in the ratio 2 : 5 : 4 : 1? Which of the following is true?
a. The largest angle in the quadrilateral is 150°.
b. The smallest angle is 30°.
c. The second-largest angle in the quadrilateral is 80°.
d. Both the largest angle in the quadrilateral is 150° and The smallest angle is 30°.

126. Read the Source/ Text given below and answer any four questions:

Chocolate is in the form of a quadrilateral with sides 6cm and 10cm, 5cm and 5cm(as shown in the figure) is cut into two parts on one of its diagonal by a lady. Part-I is given to her maid and part II is equally divided among a driver and gardener.



i. Length of BD:
a. 9cm
b. 8cm
c. 7cm
d. 6cm

ii. Area of $\triangle ABC$:
a. $24cm^2$
b. $12cm^2$
c. $42cm^2$
d. $21cm^2$

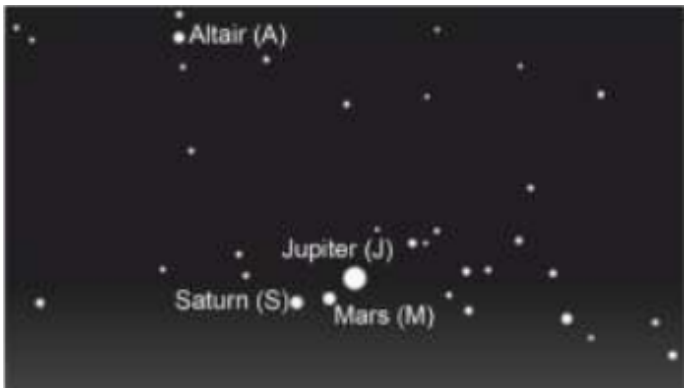
iii. The sum of all the angles of a quadrilateral is equal to:
a. 180°
b. 270°
c. 360°
d. 90°

iv. A diagonal of a parallelogram divides it into two congruent:
a. Square.
b. Parallelogram.
c. Triangles.
d. Rectangle.

v. Each angle of the rectangle is:

a. More than 90°
b. Less than 90°
c. Equal to 90°
d. Equal to 45°

127. Atul likes to observe the stars with his telescope. He likes to track the movements of stars in the sky.
He took a picture of the night sky one day. On that day, Mars was equidistant from Saturn and Jupiter.

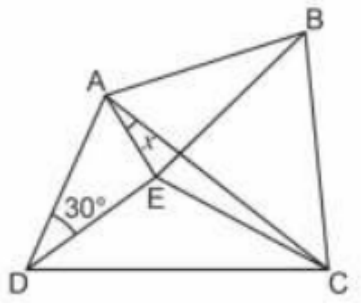


He draws a circle such that the dots showing the planets Mars (M), Jupiter (J), Saturn (S) and a star Altair (A) lies on the boundary of a circle and ∠SMJ = 150°.
1. What is the measure of ∠SAJ?
A. 30°
B. 45°
C. 150°
D. 210°
2. Atul claims that the quadrilateral MJAS is a kite.
What additional information is required to conirm his claim?
A. Distance between Altair and Saturn is equal to the distance between Mars and Jupiter.
B. Distance between Altair and Jupiter is equal to the distance between Mars and Saturn.
C. Distance between Altair and Saturn is equal to the distance between Altair and Mars.
D. Distance between Altair and Saturn is equal to the distance between Altair and Jupiter.
3. The adjacent sides of quadrilateral A are equal to corresponding sides of Quadrilateral B. All angles of Quadrilateral A measure 90°. The angles of Quadrilateral B are 120°, 60°, 120° and 60° respectively.
Which quadrilateral has a greater area? Give reasons.
4. Sanya has a triangular piece of land. She wants to divide it into four equal areas.
Suggest a way to do so.
5. Does joining four distinct points always produce a quadrilateral? Justify your answer.

128. The figure below shows the side view of a shopping trolley. The metal plate is fixed on the side by the store keeper for advertisement.

6. Three angles of the basket are obtuse. Which type of angle is the fourth?
   A. Acute
   B. Obtuse
   C. Right
   D. Relex
7. What is the shape of the metal plate?
   A. Square
   B. ectangle
   C. Rhombus
   D. Parallelogram

129. In the quadrilateral ABCD given below, ∠DAC = 90° and AB = AC = AD = DE = EB.



8. What is the value of ∠EAC?
   A. 15°
   B. 30°
   C. 45°
   D. 90°
9. Which type of quadrilateral is ABCE?
   A. Rhombus
   B. Kite
   C. Trapezium
   D. Parallelogram
10. What is the value of ∠ABE?
   A. 20°
   B. 30°
   C. 45°
   D. 60°

----- one day,day-1 -----