MATHS

BOOKS - NCERT EXEMPLAR

UNDERSTANDING QUADRILATERALS AND PRACTICAL GEOMETRY

Solved Examples

1. The number of diagonals of a polygon of n sides is-

A. $\frac{n(n-1)}{2}$

B. $\frac{n(n-2)}{2}$

C. $\frac{n(n-3)}{2}$

D. $n(n-3)$

Answer: C

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2. 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. kite

B. parallelogram

C. rhombus

D. trapezium

Answer: D

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3. Prove that; If the diagonals of a quadrilateral bisect each other at right angles, then it is a rhombus.

A. rhombus

B. trapezium

C. rectangle

D. kite

Answer: A

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4. The sum of the angles of a quadrilateral is

A. 180°

B. 270°

C. 360°

D. 300°

Answer: C

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5. In a square ABCD, the diagonals meet at point O. The ΔAOB is

A. isosceles right triangle

B. equilateral triangle

C. isosceles triangle but not right triangle

D. scalene right triangle.

Answer: A

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6. ABCD is a quadrilateral in which AB = 5 cm, CD = 8 cm and the sum of angle A and angle D is 180^{o}. What is the name of this quadrilateral?

A. Parallelogram

B. Trapezium

C. Rhombus

D. Can not be determined

Answer: B

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7. Rukmini has a farm land which is triangular in shape. What is the sum of all the exterior angles taken in an order of the farm land?

A. 90^{o}

B. 180^{o}

C. 360^{o}

D. Can not be determined.

Answer: C

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8. How many sides does an octagon have?

A. 7

B. 9

C. 8

D. 10

Answer: C

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9. The diagonals of a rhombus bisect each other at _____ angles.

A. Acute

B. Obtuse

C. Right.

D. Straight

Answer: C

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10. For getting diagonals through vertex A of a pentagon ABCDE, A is joined to _____.

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11. For constructing a unique quadrilateral at least _____ measurements are required.

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12. If diagonals of a quadrilateral bisect at right angles it is a _____.

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13. The diagonals of a _____ intersect at right angles.

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14. Every rectangle is a parallelogram. true or false

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15. Every rhombus is a kite.

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16. Every parallelogram is a trapezium.

A. No

B. Yes

C.

D.

Answer: True.

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17. state whether the statement are true (T) or false (F).

Every kite is a trapezium.

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18. state whether the statement are true (T) or false (F).

Every kite is a parallelogram.

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19. Diagonals of a rectangle are perpendicular to each other.

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20. state whether the statement are true (T) or false (F)

For constructing a unique parallelogram lengths of only two sides should be given.

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21. state whether the statement are true (T) or false (F).

is a simple closed curve.

A. True

B. False

C. Cannot say

D. None

Answer: B

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22. state whether the statement are true (T) or false (F).

is a concave polygon.

A. False

B. True

C. Cannot say

D. None

Answer: B

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23. A triangle is not a polygon. (True/False)

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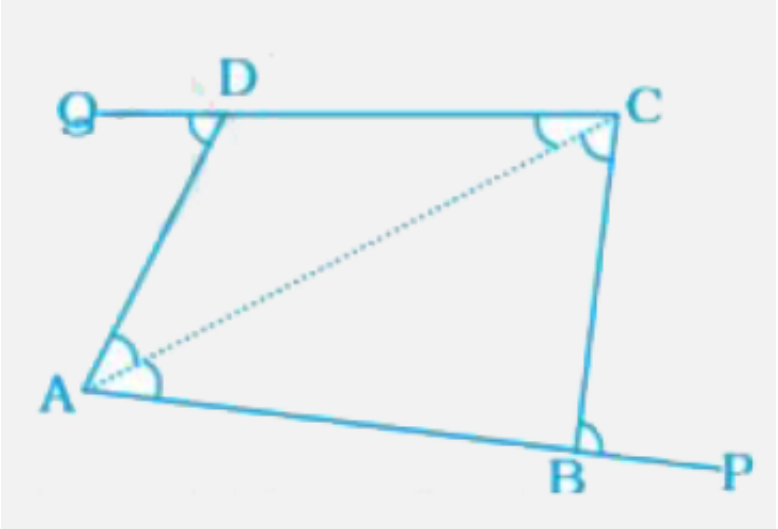
24. The sides AB and CD of a quadrilateral ABCD are extended to points P and Q respectively. Is

$\angle ADQ + \angle CBP = \angle A + \angle C$? Give reason.



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25. If AM and CN are perpendiculars on the diagonal BD of a parallelogram ABCD, Is $\Delta AMD \cong \Delta CNB$? Give reason.

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26. Construct a quadrilateral ABCD in which AB = AD = 5cm, BC = CD = 7cm and BD = 6cm. What type of quadrilateral is this?

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27. Two adjacent angles of a parallelogram are in the ratio 4:5. Find their measures.

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28. The four angles of a quadrilateral are in the ratio 3 : 4 : 5 : 6. Find the angles.

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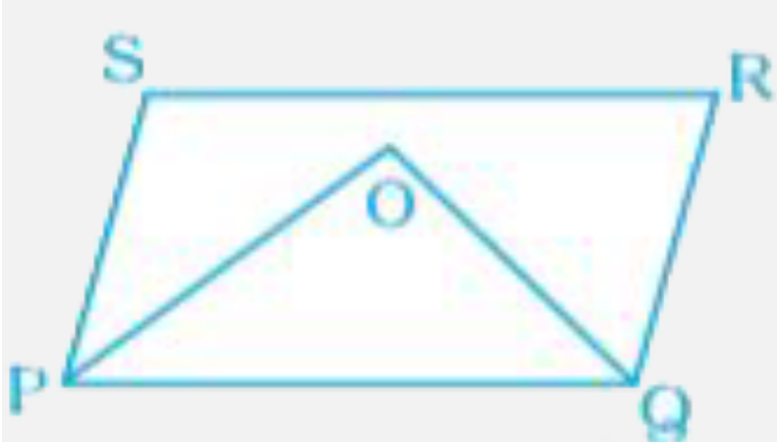
29. In a parallelogram PQRS, the bisectors of $\angle$ P and $\angle$Q meet at O. Find $\angle$POQ.



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30. Three angles of a quadrilateral are 50^{o}, 40^{o} and 123^{o}. Find its fourth angle.

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31. The ratio of exterior angle to interior angle of a regular polygon is 1:4. Find the number of sides of the polygon.

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32. Each interior angle of a polygon is 108°. Find the number of sides of the polygon.

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33. Construct a rhombus PAIR, given that PA = 6 cm and angle $\angle A$ = 110°.

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34. One of the diagonals of a rhombus and its sides are equal. Find the angles of the rhombus.

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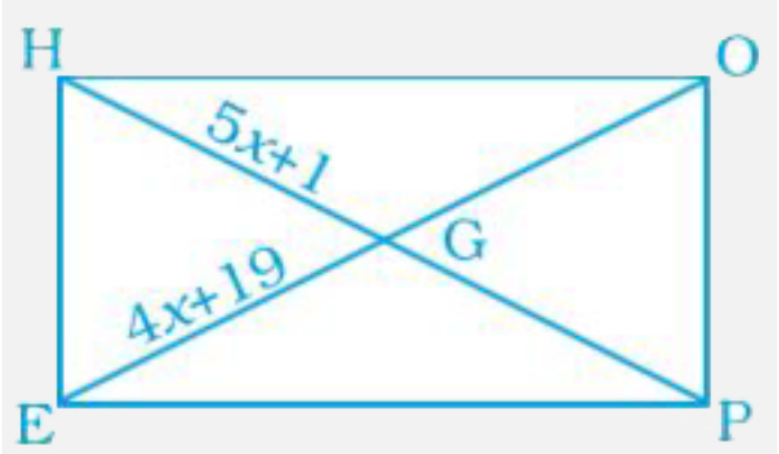
35. In the figure, HOPE is a rectangle. Its diagonals meet at G. If HG = 5x + 1 and EG = 4x

+ 19, find x.



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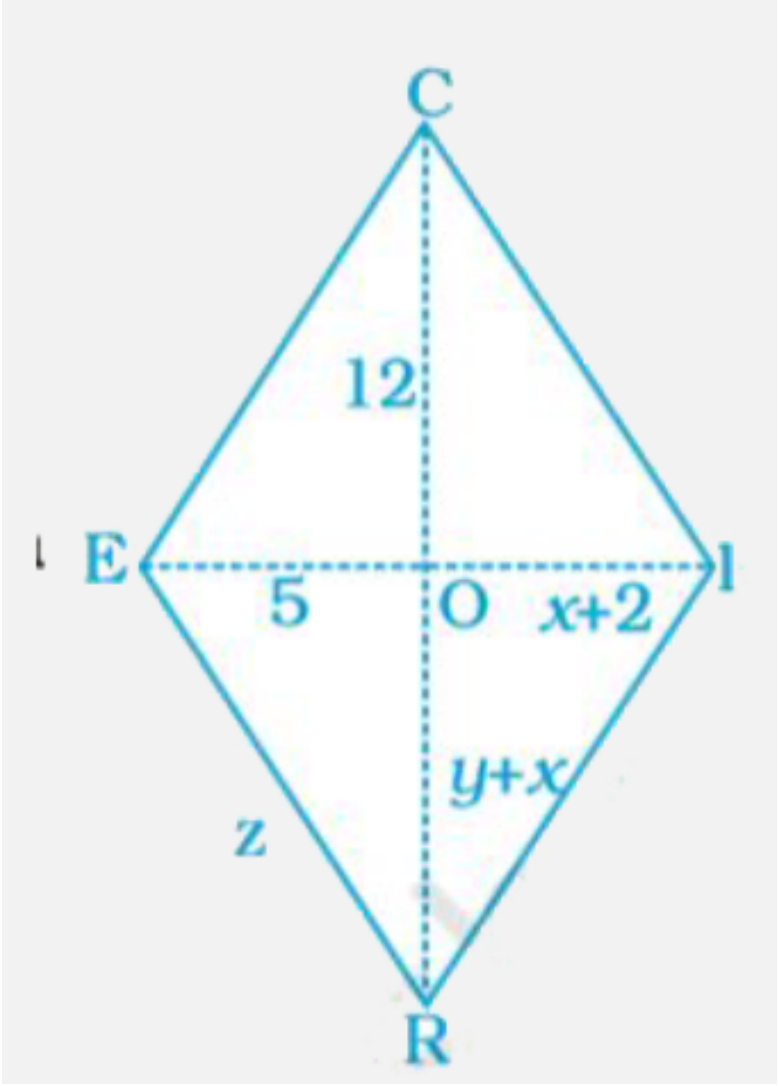
36.

RICE is a rhombus. Find x, y, z.



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37. Application on the problem solution strategy

Construct a rhombus with side 4.5cm and diagonal 6cm.

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Exercise

1. If three angles of a quadrilateral are each equal to 75°, the fourth angle is

A. 150°

B. 135°

C. 45°

D. 75°

Answer: B

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2. For which of the following, diagonals bisect each other?

A. Square

B. Kite

C. Trapezium

D. Quadrilateral

Answer: A

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3. For which of the following figures, all angles are equal?

A. Rectangle

B. Kite

C. Trapezium

D. Rhombus

Answer: A

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4. For which of the following figures, diagonals are perpendicular to each other?

A. Parallelogram

B. Kite

C. Trapezium

D. Rectangle

Answer: B

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5. For which of the following , diagonals are equal?

A. Trapezium

B. Rhombus

C. Parallelogram

D. Rectangle

Answer: D

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6. Which of the following figures satisfy the following properties?

- All sides are congruent.

- All angles are right angles.

- Opposite sides are parallel.

A. P

B. Q

C. R

D. S

Answer:

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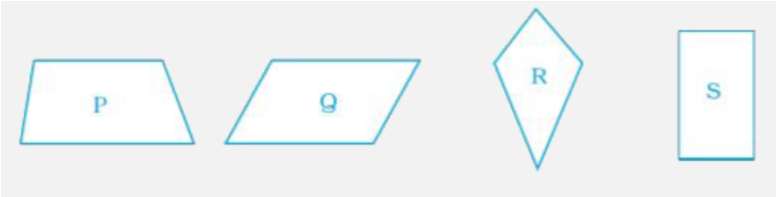
7. Which of the following figures satisfy the following property? - Has two pairs of congruent adjacent sides.



A. P

B. Q

C. R

D. S

Answer:

Watch Video Solution

8. Which of the following figures satisfy the following property? - Only one pair of sides are parallel.

A. P

B. Q

C. R

D. S

Answer:

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9. Which of the following figures do not satisfy any of the following properties?

- All sides are equal.

- All angles are right angles.

- Opposite sides are parallel.

A. P

B. Q

C. R

D. S

Answer:

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10. Which of the following properties describe a trapezium?

A. A pair of opposite sides is parallel.

B. The diagonals bisect each other.

C. The diagonals are perpendicular to each other.

D. The diagonals are equal.

Answer: A

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11. What is the maximum number of obtuse angles that a quadrilateral can have ?

A. 1

B. 2

C. 3

D. 4

Answer: C

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12. How many non-overlapping triangles can we make in a n-gon (polygon having n sides), by joining the vertices?

A. n –1

B. n –2

C. n –3

D. n –4

Answer:

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13. What is the sum of all angles of a hexagon?

A. 180°

B. 360°

C. 540°

D. 720°

Answer: D

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14. If two adjacent angles of a parallelogram are $(5x - 5)^{\circ}$ and $(10x + 35)^{\circ}$, then the ratio of these angles is

A. $1:3$

B. $2:3$

C. $1:4$

D. $1:2$

Answer: A

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15. A quadrilateral whose all sides are equal, opposite angles are equal and the diagonals bisect each other at right angles is a _____.

A. rhombus

B. parallelogram

C. square

D. rectangle

Answer: A

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16. A quadrilateral whose opposite sides and all the angles are equal is a

A. rectangle

B. parallelogram

C. square

D. rhombus

Answer:

Watch Video Solution

17. A quadrilateral whose all sides, diagonals and angles are equal is a

A. square

B. trapezium

C. rectangle

D. rhombus

Answer: A

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18. How many diagonals does a hexagon have?

A. 9

B. 8

C. 22

D. 6

Answer:

Watch Video Solution

19. If the adjacent sides of a parallelogram are equal then parallelogram is a

A. rectangle

B. trapezium

C. rhombus

D. square

Answer:

Watch Video Solution

20. If the diagonals of a quadrilateral are equal and bisect each other, then the quadrilateral is a

A. rhombus

B. rectangle

C. square

D. parallelogram

Answer:

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21. find the sum of all exterior angles of a triangle.

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22. Which of the following is an equiangular and equilateral polygon?

A. Square

B. Rectangle

C. Rhombus

D. Right triangle

Answer:

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23. Which one has all the properties of a kite and a parallelogram?

A. Trapezium

B. Rhombus

C. Rectangle

D. Parallelogram

Answer: B

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24. The angles of a quadrilateral are in the ratio 1 : 2 : 3 : 4. The smallest angle is

A. 72°

B. 144°

C. 36°

D. 18°

Answer: C

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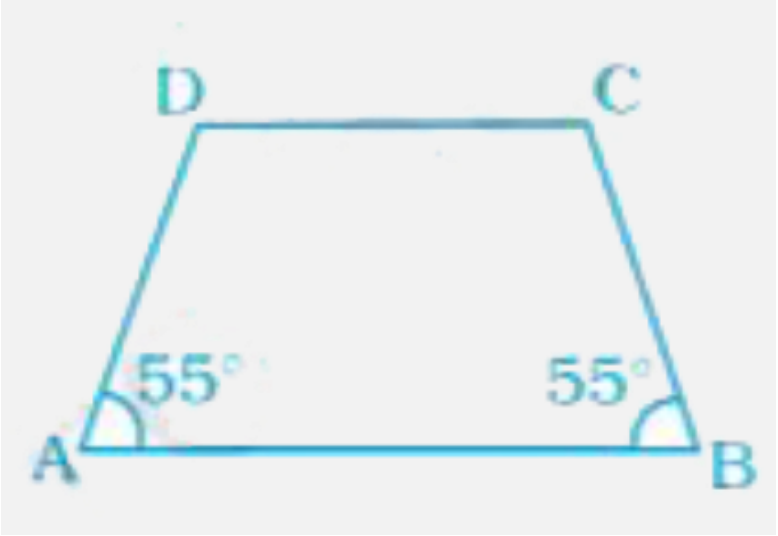
25. In the trapezium ABCD, the measure of $\angle D$ is



A. 55°

B. 115°

C. 135°

D. 125°

Answer: D

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26. A quadrilateral has three acute angles. If each measures 80°, then the measure of the fourth angle is

A. 150°

B. 120°

C. 105°

D. 140°

Answer:

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27. The number of sides of a regular polygon where each exterior angle has a measure of 45^{o} is

A. 8

B. 10

C. 4

D. 6

Answer: A

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28. In a parallelogram PQRS, if $\angle P = 60^\circ$, then other three angles are

A. 45º, 135º, 120º

B. 60º, 120º, 120º

C. 60º, 135º, 135º

D. 45º, 135º, 135º

Answer: B

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29. If two adjacent angles of a parallelogram are in the ratio $2:3$, then the measure of angles are

A. $72^\circ, 108^\circ$

B. $36^\circ, 54^\circ$

C. $80^\circ, 120^\circ$

D. $96^\circ, 144^\circ$

Answer: A

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30. If PQRS is a parallelogram, then $\angle P - \angle R$ is equal to

A. 60°

B. 90°

C. 80°

D. 0°

Answer: D

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31. The sum of adjacent angles of a parallelogram is

A. 180°

B. 120°

C. 360°

D. 90°

Answer:

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32. The angle between the two altitudes of a parallelogram through the same vertex of an obtuse angle of the parallelogram is 30°. The measure of the obtuse angle is

A. 100°

B. 150°

C. 105°

D. 120°

Answer: B

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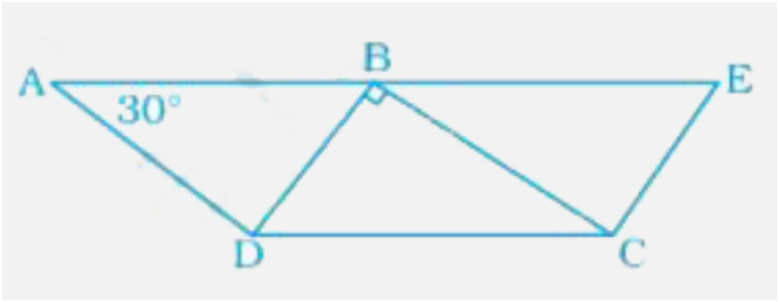
33. In the given figure, ABCD and BDCE are parallelograms with common base DC. If BC $\perp$ BD, then $\angle BEC$ =



A. 60°

B. 30°

C. 150°

D. 120°

Answer:

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34. Length of one of the diagonals of a rectangle whose sides are 10 cm and 24 cm is

A. 25 cm

B. 20 cm

C. 26 cm

D. 3.5 cm

Answer: C

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35. If the adjacent angles of a parallelogram are equal, then the parallelogram is a

A. rectangle

B. trapezium

C. rhombus

D. any of the three

Answer:

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36. Which of the following can be four interior angles of a quadrilateral?

A. $140^\circ, 40^\circ, 20^\circ, 160^\circ$

B. $270^\circ, 150^\circ, 30^\circ, 20^\circ$

C. $40^\circ, 70^\circ, 90^\circ, 60^\circ$

D. $110^\circ, 40^\circ, 30^\circ, 180^\circ$

Answer: A

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37. The sum of angles of a concave quadrilateral is

A. more than 360°

B. less than 360°

C. equal to 360°

D. twice of 360°

Answer: C

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38. Which of the following can never be the measure of exterior angle of a regular polygon?

A. 22°

B. 36°

C. 45°

D. 30°

Answer: A

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39. In the figure, BEST is a rhombus, Then the value of y – x is

A. 40°

B. 50°

C. 20°

D. 10°

Answer:

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40. The closed curve which is also a polygon is

A. 

B. 

C. 

D. 

Answer:

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41. Which of the following is not true for an exterior angle of a regular polygon with n sides?

A. Each exterior angle = $\frac{360^\circ}{n}$

B. Exterior angle = 180° – interior angle

C. $n = \frac{360^\circ}{\text{exterior angle}}$

D. Each exterior angle = $\frac{(n-2) \times 180^\circ}{n}$

Answer: D

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42. PQRS is a square. PR and SQ intersect at O.

Then $\angle$POQ is a

A. Right angle

B. Straight angle

C. Reflex angle

D. Complete angle

Answer:

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43. Two adjacent angles of a parallelogram are in the ratio 1:5. find all the angles of the parallelogram.

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44. A parallelogram PQRS is constructed with sides QR = 6 cm, PQ = 4 cm and $\angle PQR$ = 90°. Then PQRS is a

A. square

B. rectangle

C. rhombus

D. trapezium

Answer:

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45. The angles P, Q, R and S of a quadrilateral are in the ratio 1:3:7:9. Then PQRS is a

A. parallelogram

B. trapezium with PQ || RS

C. trapezium with QR||PS

D. kite

Answer:

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46. PQRS is a trapezium in which PQ||SR and $\angle P = 130^\circ, \angle Q = 110^\circ$. Then $\angle R$ is equal to:

A. 70°

B. 50°

C. 65°

D. 55°

Answer: A

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47. The number of sides of a regular polygon whose each interior angle is of 135° is

A. 6

B. 7

C. 8

D. 9

Answer:

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48. If diagonal of a quadrilateral bisects each other at right angles then it is a

A. kite

B. parallelogram

C. rhombus

D. rectangle

Answer:

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49. To construct a unique parallelogram, the minimum number of measurements required is

A. 2

B. 3

C. 4

D. 5

Answer: B

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50. To construct a unique rectangle, the minimum number of measurements required is

A. 4

B. 3

C. 2

D. 1

Answer:

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51. fill in the blanks to make the statements true

In quadrilateral HOPE, the pairs of opposite sides are _____.

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52. fill in the blank to make the statements true

In quadrilateral ROPE, the pairs of adjacent angles are _____.

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53. fill in the blank to make the statements true

In quadrilateral WXYZ, the pairs of opposite angles are _____.

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54. fill in the blank to make the statement true

The diagonals of the quadrilateral DEFG are _____ and _____.

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55. fill in the blank to make the statement true

The sum of all _____ of a quadrilateral is 360^{o}.

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56. The measure of each exterior angle of a regular pentagon is _____.

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57. Sum of the interior angles of a hexagon is _____.

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58. The measure of each exterior angle of a regular polygon of 18 sides is _____.

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59. The number of sides of a regular polygon, where each exterior angle has a measure of 36^{o}, is _____.

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60. fill in the blank to make the statement true

is a closed curve entirely made up of line segments. The another name for this shape is _____.

A. Polygon

B. Circle

C. Line segment

D. None

Answer: A

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61. A quadrilateral that is not a parallelogram but has exactly two opposite angles of equal measure is _____.

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62. The measure of each angle of a regular pentagon is _____.

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63. The name of three-sided regular polygon is _____.

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64. The number of diagonals in a hexagon is _____.

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65. A polygon is a simple closed curve made up of only _____.

A. Points

B. Ray

C. Line segments

D. None

Answer: C

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66. A regular polygon is a polygon whose all sides are equal and all _____ are equal.

A. Diagonals

B. Points

C. Angles

D. None

Answer: C

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67. The sum of interior angles of a polygon of n sides is _____right angles.

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68. The sum of all exterior angles of a polygon is _____.

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69. _____ is a regular quadrilateral.

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70. A quadrilateral in which a pair of opposite sides is parallel is _____.

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71. If all sides of a quadrilateral are equal, it is a _____.

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72. In a rhombus diagonals intersect at _____ angles.

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73. _____ measurements can determine a quadrilateral uniquely.

Watch Video Solution

74. A quadrilateral can be constructed uniquely if its three sides and _____ angles are given.

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75. A rhombus is a parallelogram in which _____ sides are equal.

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76. The measure of _____ angle of concave quadrilateral is more than 180^{o}.

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77. A diagonal of a quadrilateral is a line segment that joins two _____ vertices of the quadrilateral.

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78. The number of sides in a regular polygon having measure of an exterior angle as 72^{o} is _____.

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79. If the diagonals of a quadrilateral bisect each other, it is a _____.

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80. The adjacent sides of a parallelogram are 5 cm and 9 cm. Its perimeter is _____.

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81. A nonagon has _____ sides.

A. 5

B. 6

C. 8

D. 9

Answer: D

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82. Diagonals of a rectangle are _____.

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83. A polygon having 10 sides is known as _____.

Watch Video Solution

84. A rectangle whose adjacent sides are equal becomes a _____.

Watch Video Solution

85. If one diagonal of a rectangle is 6 cm long, length of the other diagonal is _____.

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86. Adjacent angles of a parallelogram are _____.

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87. If only one diagonal of a quadrilateral bisects the other, then the quadrilateral is known as _____.

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88. In trapezium ABCD with AB||CD, if $\angle A = 100^\circ$, then $\angle D$= _____.

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89. The polygon in which sum of all exterior angles is equal to the sum of interior angles is called _____.

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90. State whether the statements are true (T) or (F) false.

All angles of a trapezium are equal.

Watch Video Solution

91. State whether the statements are true (T) or (F) false.

All squares are rectangles.

Watch Video Solution

92. State whether the statements are true (T) or (F) false.

All kites are squares.

Watch Video Solution

93. State whether the statements are true (T) or (F) false.

All rectangles are parallelograms.

Watch Video Solution

94. State whether the statements are true (T) or (F) false.

All rhombuses are squares.

Watch Video Solution

95. State whether the statements are true (T) or (F) false.

Sum of all the angles of a quadrilateral is 180^{o}.

Watch Video Solution

96. State whether the statements are true (T) or (F) false.

A quadrilateral has two diagonals.

Watch Video Solution

97. State whether the statements are true (T) or (F) false.

Triangle is a polygon whose sum of exterior angles is double the sum of interior angles.

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98. State whether the statements are true (T) or (F) false.

is a polygon.

Watch Video Solution

99. State whether the statements are true (T) or (F) false.

A kite is not a convex quadrilateral.

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100. State whether the statements are true (T) or (F) false.

The sum of interior angles and the sum of exterior angles taken in an order are equal in case of quadrilaterals only.

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101. State whether the statements are true (T) or (F) false.

If the sum of interior angles is double the sum of exterior angles taken in an order of a polygon, then it is a hexagon.

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102. State whether the statements are true (T) or (F) false.

A polygon is regular if all of its sides are equal.

Watch Video Solution

103. State whether the statements are true (T) or (F) false.

Rectangle is a regular quadrilateral.

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104. State whether the statements are true (T) or (F) false.

If diagonals of a quadrilateral are equal, it must be a rectangle.

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105. State whether the statements are true (T) or (F) false.

If opposite angles of a quadrilateral are equal, it must be a parallelogram.

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106. State whether the statements are true (T) or (F) false.

The interior angles of a triangle are in the ratio 1:2:3, then the ratio of its exterior angles is 3:2:1.

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107. State whether the statements are true (T) or (F) false.

is a concave pentagon.

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108. State whether the statements are true (T) or (F) false.

Diagonals of a rhombus are equal and perpendicular to each other.

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109. State whether the statements are true (T) or (F) false.

Diagonals of a rectangle are equal.

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110. State whether the statements are true (T) or (F) false.

Diagonals of rectangle bisect each other at right angles.

Watch Video Solution

111. State whether the statements are true (T) or (F) false.

Every kite is a parallelogram.

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112. State whether the statements are true (T) or (F) false.

Every trapezium is a parallelogram.

Watch Video Solution

113. State whether the statements are true (T) or (F) false.

Every parallelogram is a rectangle.

Watch Video Solution

114. State whether the statements are true (T) or (F) false.

Every trapezium is a rectangle.

Watch Video Solution

115. State whether the statements are true (T) or (F) false.

Every rectangle is a trapezium.

Watch Video Solution

116. State whether the statements are true (T) or (F) false.

Every square is a rhombus.

Watch Video Solution

117. State whether the statements are true (T) or (F) false.

Every square is a parallelogram.

Watch Video Solution

118. State whether the statements are true (T) or (F) false.

Every square is a trapezium.

Watch Video Solution

119. State whether the statements are true (T) or (F) false.

Every rhombus is a trapezium.

Watch Video Solution

120. State whether the statements are true (T) or (F) false.

A quadrilateral can be drawn if only measures of four sides are given.

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121. State whether the statements are true (T) or (F) false.

A quadrilateral can have all four angles as obtuse.

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122. State whether the statements are true (T) or (F) false.

A quadrilateral can be drawn if all four sides and one diagonal is known.

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123. State whether the statements are true (T) or (F) false.

A quadrilateral can be drawn when all the four angles and one side is given.

Watch Video Solution

124. State whether the statements are true (T) or (F) false.

A quadrilateral can be drawn if all four sides and one angle is known.

Watch Video Solution

125. State whether the statements are true (T) or (F) false.

A quadrilateral can be drawn if three sides and two diagonals are given.

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126. State whether the statements are true (T) or (F) false.

If diagonals of a quadrilateral bisect each other, it must be a parallelogram.

Watch Video Solution

127. State whether the statements are true (T) or (F) false.

A quadrilateral can be constructed uniquely if three angles and any two sides are given..

Watch Video Solution

128. State whether the statements are true (T) or (F) false.

A parallelogram can be constructed uniquely if

both diagonals and the angle between them is given.

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129. State whether the statements are true (T) or (F) false.

A rhombus can be constructed uniquely if both diagonals are given.

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130. The diagonals of a rhombus are 8 cm and 15 cm. Find its side.

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131. Two adjacent angles of a parallelogram are in the ratio 1:3. Find its angles.

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132. Of the four quadrilaterals— square, rectangle, rhombus and trapezium— one is somewhat different from the others because of its design. Find it and give justification.

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133. In a rectangle ABCD, AB = 25 cm and BC = 15. In what ratio does the bisector of $\angle C$ divide AB?

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134. PQRS is a rectangle. The perpendicular ST from S on PR divides $\angle S$ in the ratio 2:3. Find $\angle$ TPQ.

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135. A window frame has one diagonal longer than the other. Is the window frame a rectangle? Why or why not?

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136. The adjacent angles of a parallelogram are $(2x - 4)^\circ$ and $(3x - 1)^\circ$. Find the measures of all angles of the parallelogram.

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137. The point of intersection of diagonals of a quadrilateral divides one diagonal in the ratio 1:2. Can it be a parallelogram? Why or why not?

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138. The ratio between exterior angle and interior angle of a regular polygon is 1:5. Find the number of sides of the polygon.

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139. Two sticks each of length 5 cm are crossing each other such that they bisect each other. What shape is formed by joining their end points? Give reason.

Watch Video Solution

140. Two sticks each of length 7 cm are crossing each other such that they bisect each other at right angles. What shape is formed by joining their end points? Give reason.

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141. A playground in the town is in the form of a kite. The perimeter is 106 metres. If one of its

sides is 23 metres, what are the lengths of other three sides?

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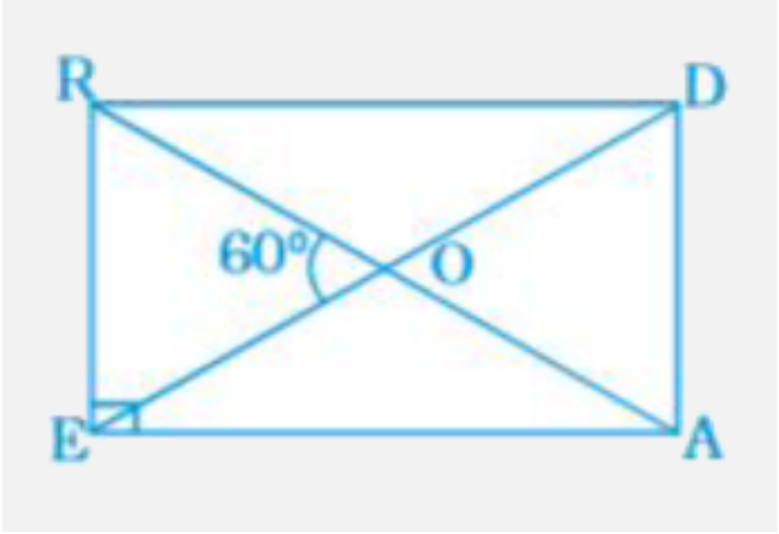
142. In rectangle READ, find $\angle EAR$, $\angle RAD$ and $\angle ROD$



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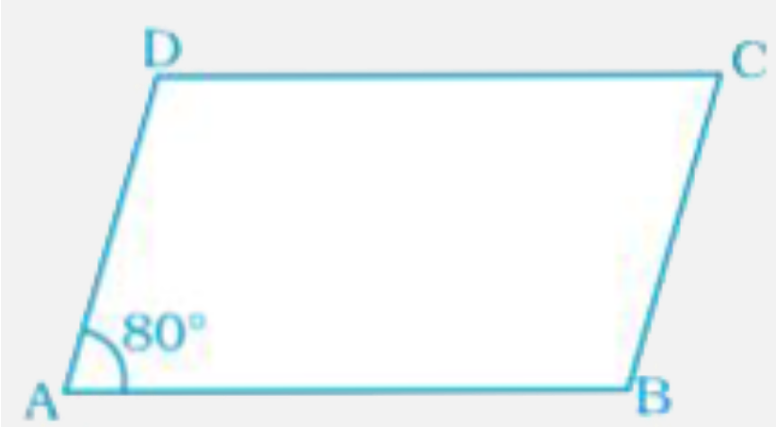
143. In parallelogram ABCD, find $\angle B$, $\angle C$ and $\angle D$.



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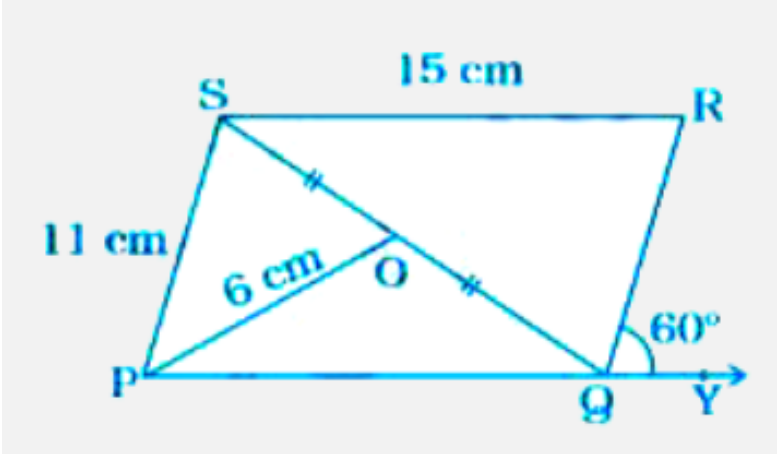
144. In parallelogram PQRS, O is the mid point of SQ. Find $\angle S$, $\angle R$, PQ, QR and diagonal PR.



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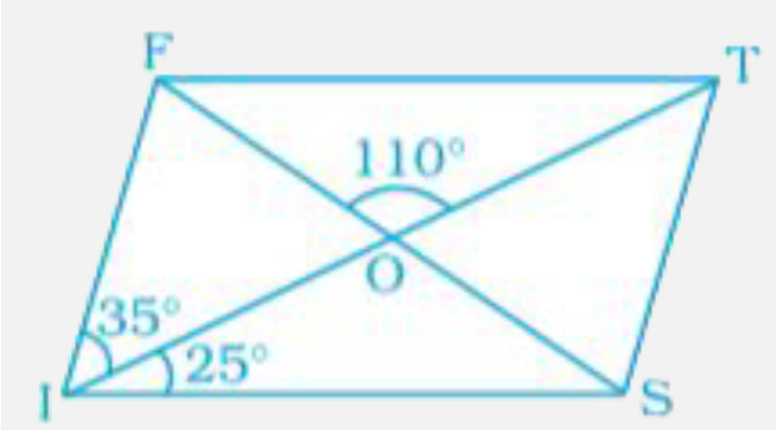
145. In parallelogram FIST, find $\angle SFT$, $\angle OST$ and $\angle STO$.



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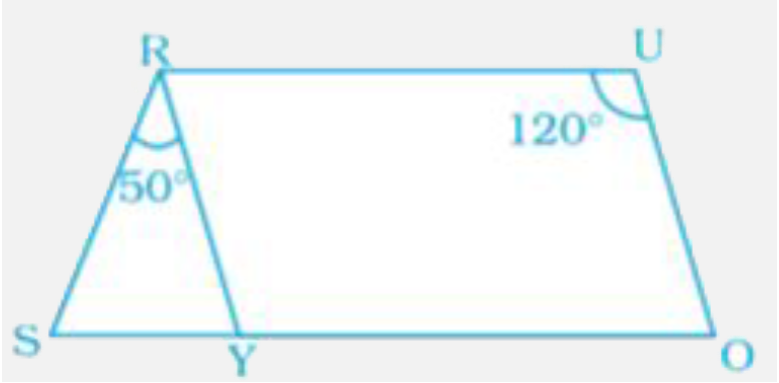
146. In the given parallelogram YOUR, ∠RUO = 120° and OY is extended to point S such that ∠

SRY = 50°. Find ∠YSR.



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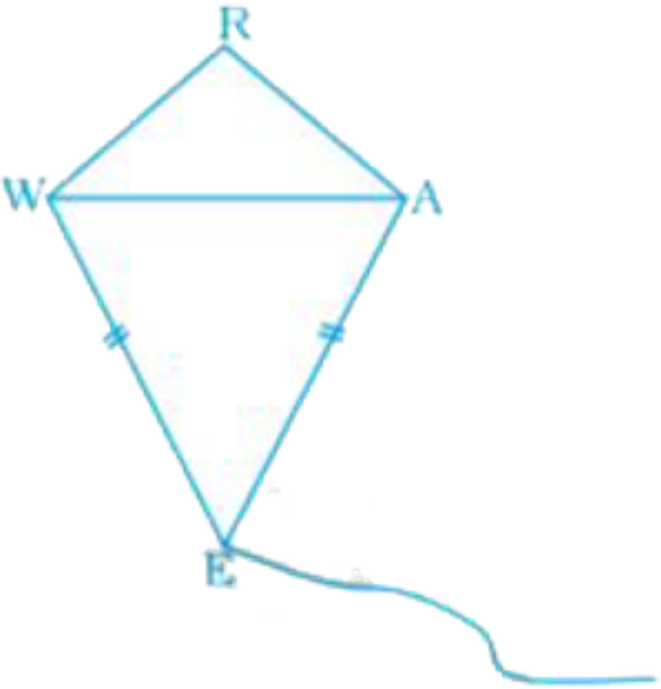
147. In kite WEAR, ∠WEA = 70° and ∠ARW = 80°.

Find the remaining two angles.



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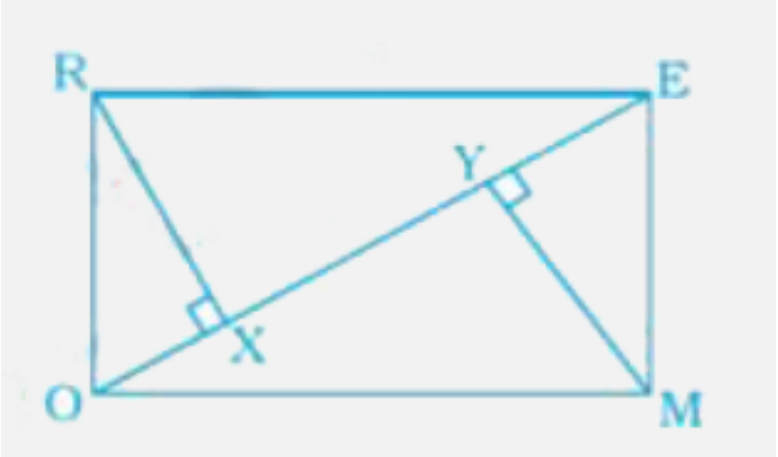
148. A rectangular MORE is shown below:

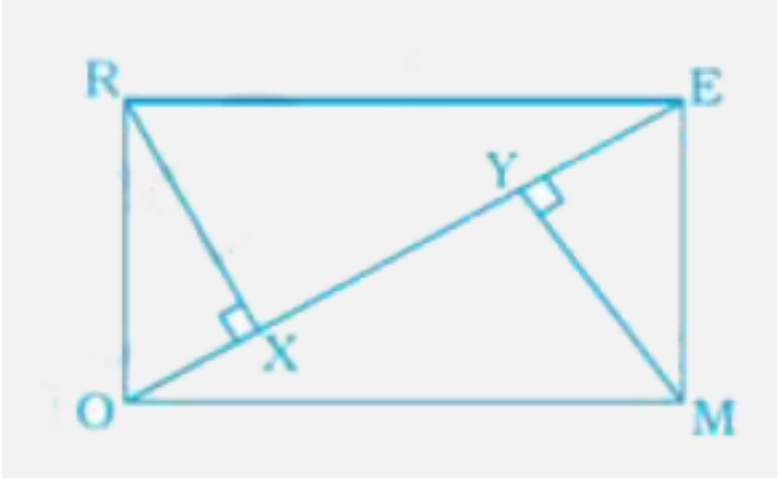


Answer the following questions by giving appropriate reason.

Is RE = OM?

Watch Video Solution

149. A rectangular MORE is shown below:

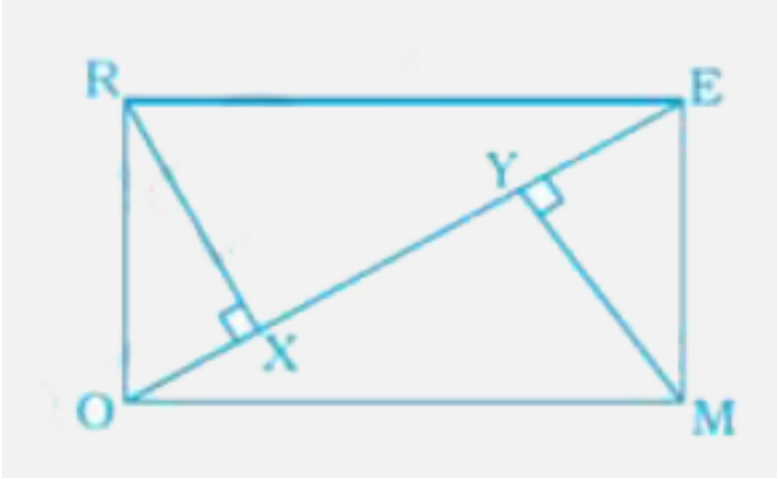


Answer the following questions by giving appropriate reason.

Is $\angle MOY = \angle REX$?

Watch Video Solution

150. A rectangular MORE is shown below:

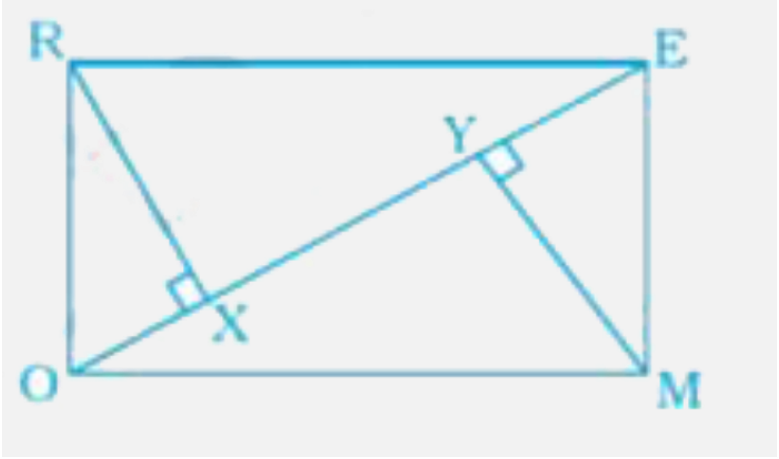


Answer the following questions by giving appropriate reason.

Is $\angle MOY = \angle REX$?

Watch Video Solution

151. A rectangular MORE is shown below:



Answer the following questions by giving appropriate reason.

Is $\Delta MYO \cong \Delta RXE$?

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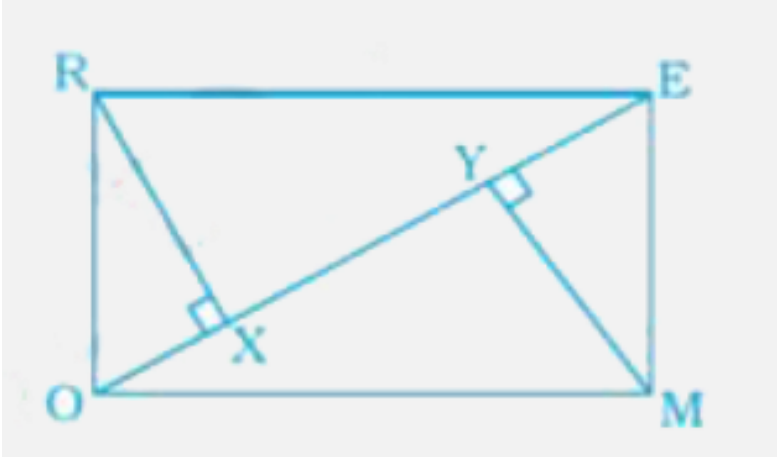
152. A rectangular MORE is shown below:



Answer the following questions by giving appropriate reason.

Is RE = OM?

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153. In parallelogram MODE, the bisector of $\angle$ M and $\angle$O meet at Q, find the measure of $\angle$ MQO.

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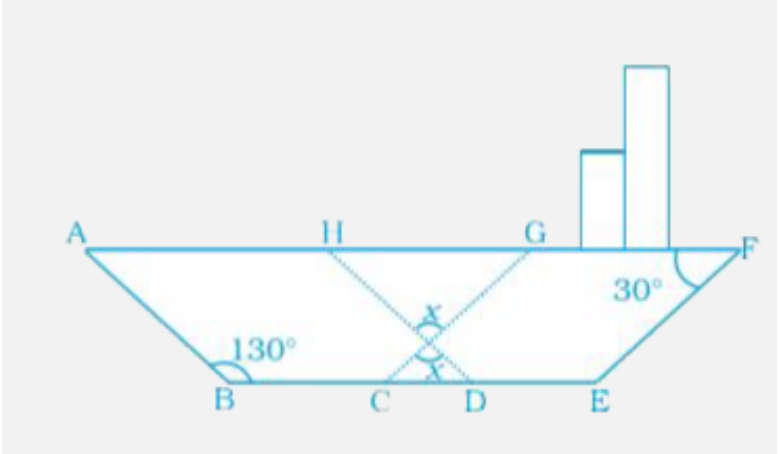
154. In the following figure of a ship, ABDH and CEFG are two parallelograms. Find the value of

x.



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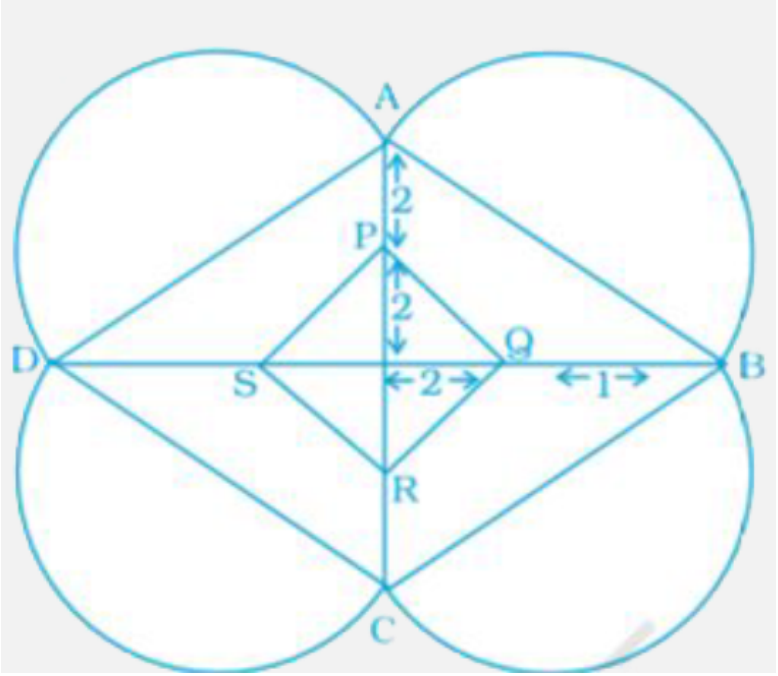
155. A Rangoli has been drawn on a flor of a house. ABCD and PQRS both are in the shape of a rhombus. Find the radius of semicircle

drawn on each side of rhombus ABCD.



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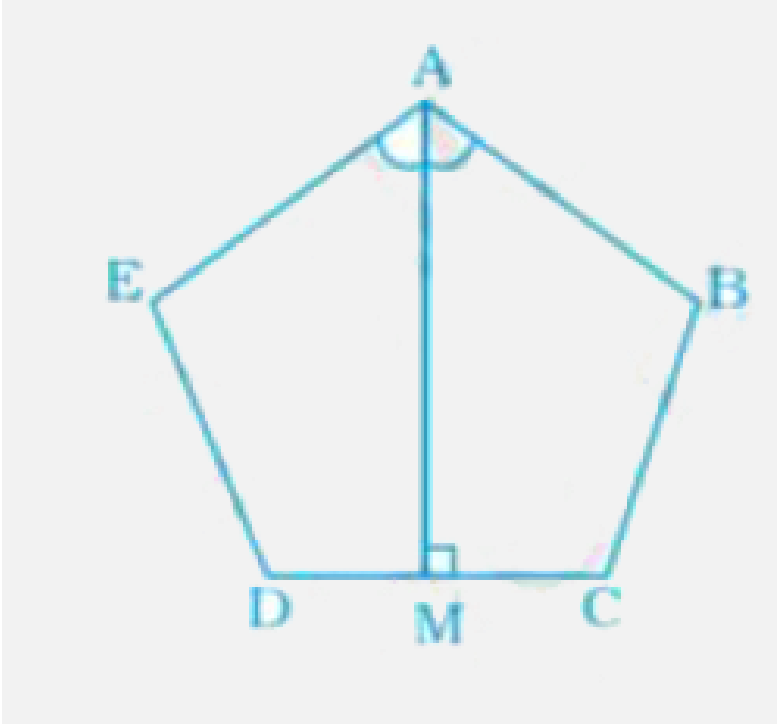
156. ABCDE is a regular pentagon. The bisector of angle A meets the side CD at M. Find $\angle AMC$



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157. Quadrilateral EFGH is a rectangle in which J is the point of intersection of the diagonals.

Find the value of x if JF = 8x + 4 and EG = 24x – 8.

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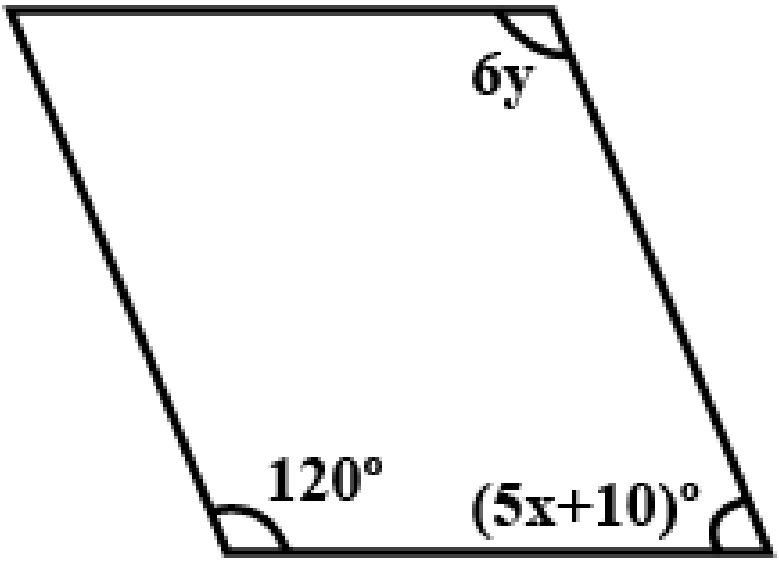
158. Find the values of x and y in the following parallelogram.



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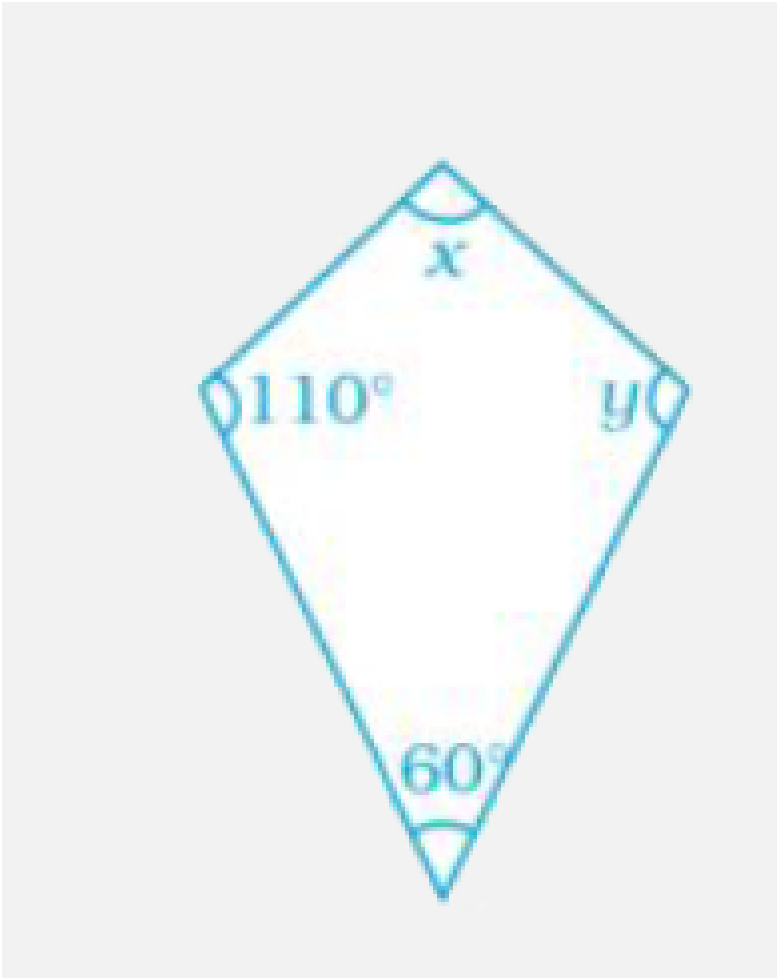
159. Find the values of x and y in the following kite.



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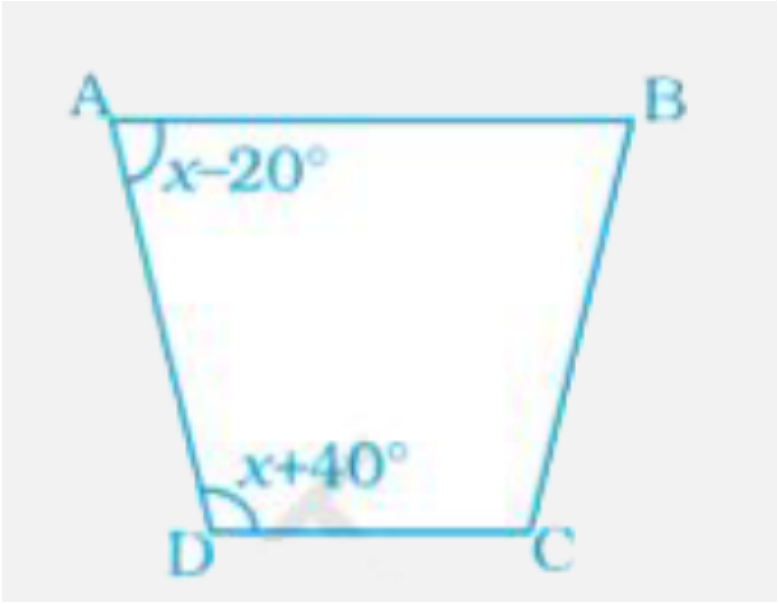
160. Find the value of x in the trapezium ABCD given below.



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161. Two angles of a quadrilateral are each of measure 75° and the other two angles are equal. What is the measure of these two angles? Name the possible figures so formed.

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162. In a quadrilateral PQRS, $\angle P = 50^{\circ}$, $\angle Q = 50^{\circ}$, $\angle R = 60^{\circ}$. Find $\angle S$. Is this quadrilateral convex or concave?

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163. Both the pairs of opposite angles of a quadrilateral are equal and supplementary. Find the measure of each angle.

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164. Find the measure of each exterior angle of a regular octagon.

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165. Find the measure of an are exterior angle of a regular pentagon and an exterior angle of a regular decagon. What is the ratio between these two angles?

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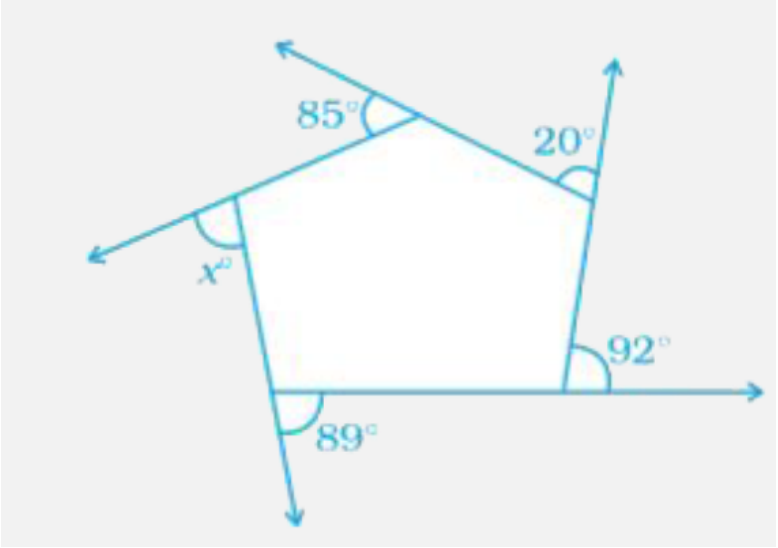
166. In the figure, find the value of x.



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167. Three angles of a quadrilateral are equal. Fourth angle is of measure 120°. What is the measure of equal angles?

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168. In a quadrilateral HOPE, PS and ES are bisectors of $\angle P$ and $\angle E$ respectively. Give reason.

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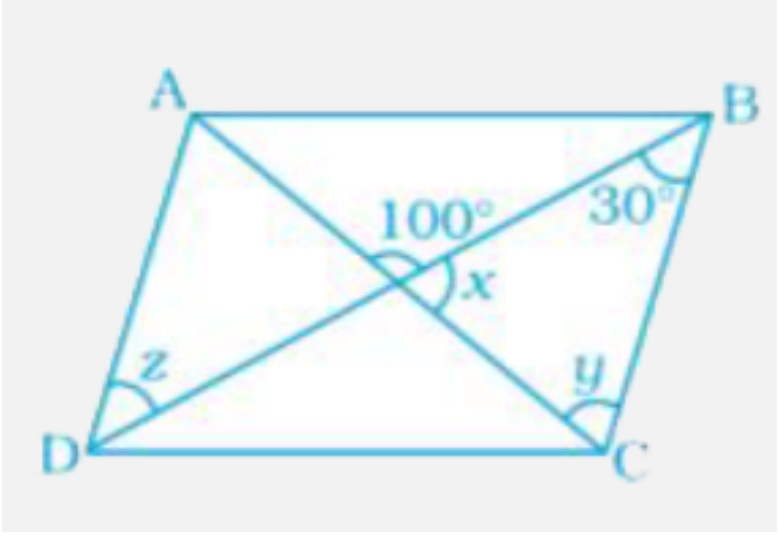
169. ABCD is a parallelogram. Find the value of x, y and z.



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170. Diagonals of a quadrilateral are perpendicular to each other. Is such a quadrilateral always a rhombus? Give a figure to justify your answer.

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171. ABCD is a trapezium such that AB||CD, $\angle A : \angle D = 2:1$, $\angle B : \angle C = 7:5$. Find the angles of the trapezium.

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172. A line l is parallel to line m and a transversal p interesects them at X, Y respectively. Bisectors of interior angles at X

and Y interesct at P and Q. Is PXQY a rectangle? Given reason.

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173. ABCD is a parallelogram. The bisector of angle A intersects CD at X and bisector of angle C intersects AB at Y. Is AXCY a parallelogram? Give reason.

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174. A diagonal of a parallelogram bisects an angle. Will it also bisect the other angle? Give reason.

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175. The angle between the two altitudes of a parallelogram through the vertex of an obtuse angle of the parallelogram is 45°. Find the angles of the parallelogram.

Watch Video Solution

176. ABCD is a rhombus such that the perpendicular bisector of AB passes through D. Find the angles of the rhombus.

Hint: Join BD. Then Δ ABD is equilateral.

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177. ABCD is a parallelogram. Points P and Q are taken on the sides AB and AD respectively and the parallelogram PRQA is formed. If $\angle C = 45^\circ$, find $\angle R$.

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178. In parallelogram ABCD, the angle bisector of $\angle A$ bisects BC. Will angle bisector of B also bisect AD? Give reason.

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179. A regular pentagon ABCDE and a square ABFG are formed on opposite sides of AB. Find $\angle BCF$.

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180. Find the maximum number of acute angles that a convex quadrilateral, a pentagon and a hexagon can have. Observe the pattern and generalize the result for any polygon.

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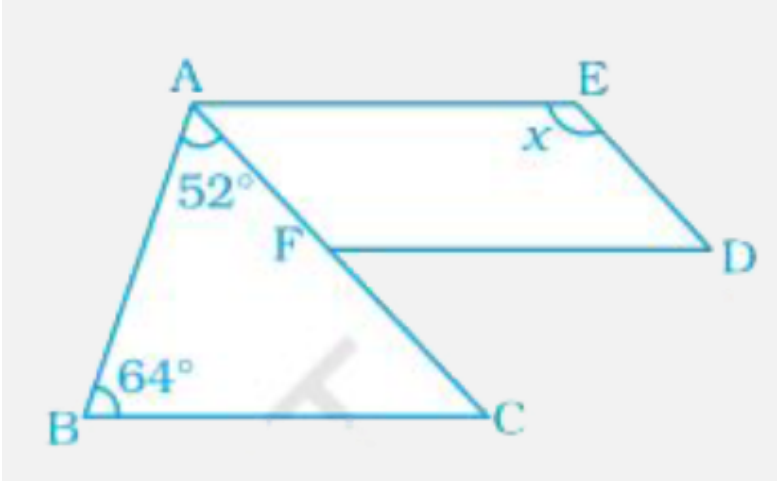
181. In the following figure, FD||BC||AE and AC||ED. Find the value of x.



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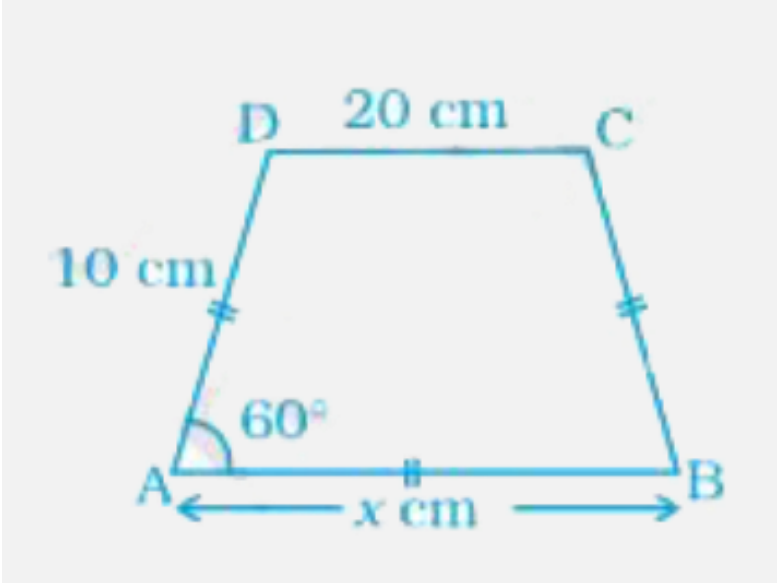
182. In the following figure, AB||DC and AD = BC.

Find the value of x.



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183. Construct a trapezium ABCD in which AB||DC, $\angle A = 105^\circ$, AD = 3 cm, AB = 4 cm and CD = 8 cm.

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184. Construct a parallelogram ABCD in which AB = 4 cm, BC = 5 cm and $\angle B = 60^{o}$.

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185. Construct a rhombus whose side is 5 cm and one angle is of 60^{o}.

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186. Construct a rectangle whose one side is 3 cm and a diagonal equal to 5 cm.

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187. Construct a square of side 4 cm.

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188. Construct a rhombus CLUE in which CL = 7.5 cm and LE = 6 cm.

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189. Construct a quadrilateral BEAR in which BE = 6 cm, EA = 7 cm, RB = RE = 5 cm and BA = 9 cm. Measure its fourth side.

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190. Construct a parallelogram POUR in which, PO=5.5 cm, OU = 7.2 cm and $\angle O = 70^{\circ}$.

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191. Draw a circle of radius 3 cm and draw its diameter and label it as AC. Construct its perpendicular bisector and let it intersect the circle at B and D. What type of quadrilateral is ABCD? Justify your answer.

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192. Construct a parallelogram HOME with HO = 6 cm, HE = 4 cm and OE = 3 cm.

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193. Is it possible to construct a quadrilateral ABCD in which AB = 3 cm, BC = 4 cm, CD = 5.4 cm, DA = 5.9 cm and diagonal AC = 8 cm? If not, why?

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194. Is it possible to construct a quadrilateral ROAM in which RO=4 cm, OA = 5 cm, $\angle O = 120^{\circ}$, $\angle R = 105^{\circ}$ and $\angle A = 135^{\circ}$? If not, why?

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195. Construct a square in which each diagonal is 5cm long.

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196. Construct a quadrilateral NEWS in which NE = 7cm, EW = 6 cm, $\angle N = 60^{\circ}$, $\angle E = 110^{\circ}$ and $\angle S = 85^{\circ}$.

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197. Construct a parallelogram when one of its side is 4cm and its two diagonals are 5.6 cm and 7cm. Measure the other side.

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198. Find the measure of each angle of a regular polygon of 20 sides?

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199. Construct a trapezium RISK in which RI||KS, RI = 7 cm, IS = 5 cm, RK=6.5 cm and $\angle I = 60^{\circ}$.

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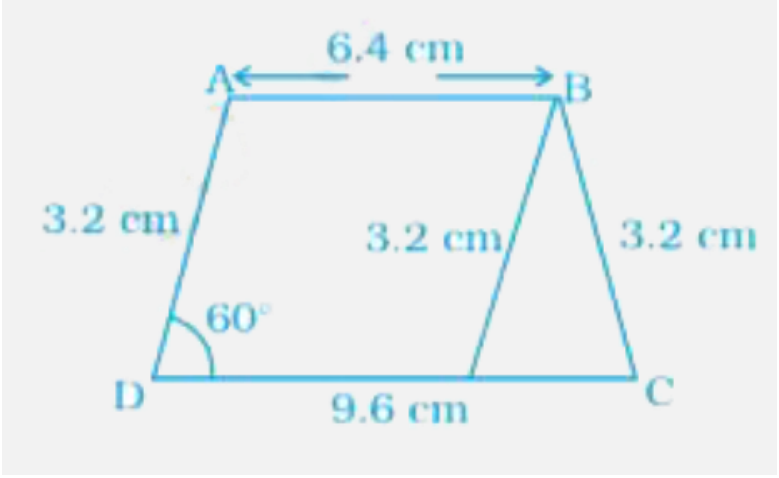
200. Construct a trapezium ABCD where AB||CD, AD = BC = 3.2cm, AB = 6.4 cm and CD = 9.6 cm. Measure $\angle B$ and $\angle A$.



[Hint : Difference of two parallel sides gives an equilateral triangle.]

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Applications Games And Puzzles

1. Have students take each of the quadrilateral named below, join, in order, the mid points of the sides and describe the special kind of quadrilaterals they get each time:

Rhombus

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2. Have students take each of the quadrilateral named below, join, in order, the mid points of the sides and describe the special kind of

quadrilaterals they get each time:

Rectangle.

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3. Crossword Puzzle

Solve the given crossword and then fill up the given boxes (on the next page). Clues are given below for across as well as downward filling. Also, for across and down clues, clue number is written at the corner of the boxes. Answers of clues have to be filled up in their

respective boxes.

Clues

Across

1. A quadrilateral with pair of parallel sides.

2. A simple closed curve made up of only line segments.

3. A quadrilateral which has exactly two distinct consecutive pairs of sides of equal length.

4. A line segment connecting two non-consecutive vertices of a polygon.

5. The diagonals of a rhombus are _____ bisectors of one another.

6. The _____ sides of a parallelogram are of equal length.

7. The number of sides of a regular polygon whose each exterior angle has a measure of 450.

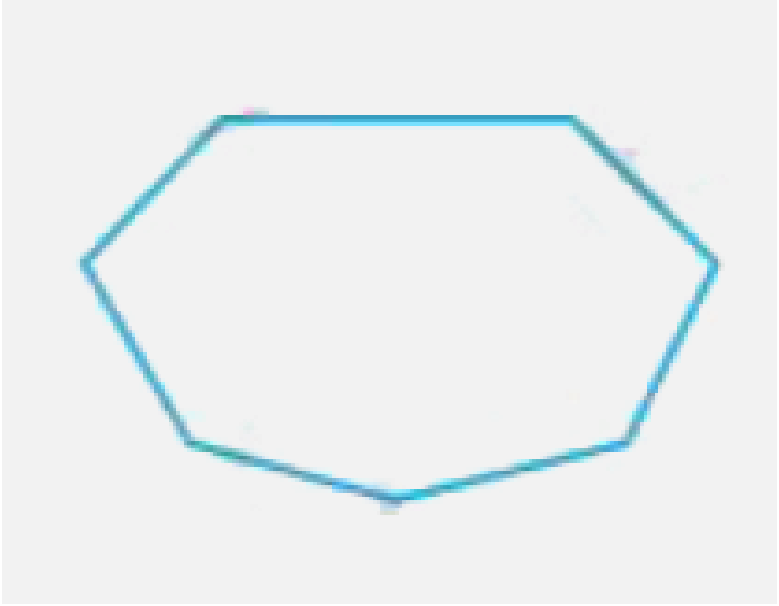
8. The sum of measure of the three angles of a _____ is 1800.

9. A polygon which is both equiangular and equilateral is called a _____ polygon.

10. Number of sides of a nonagon.

Down

11. Name of the figure



12. The _____ angles of a parallelogram are supplementary.

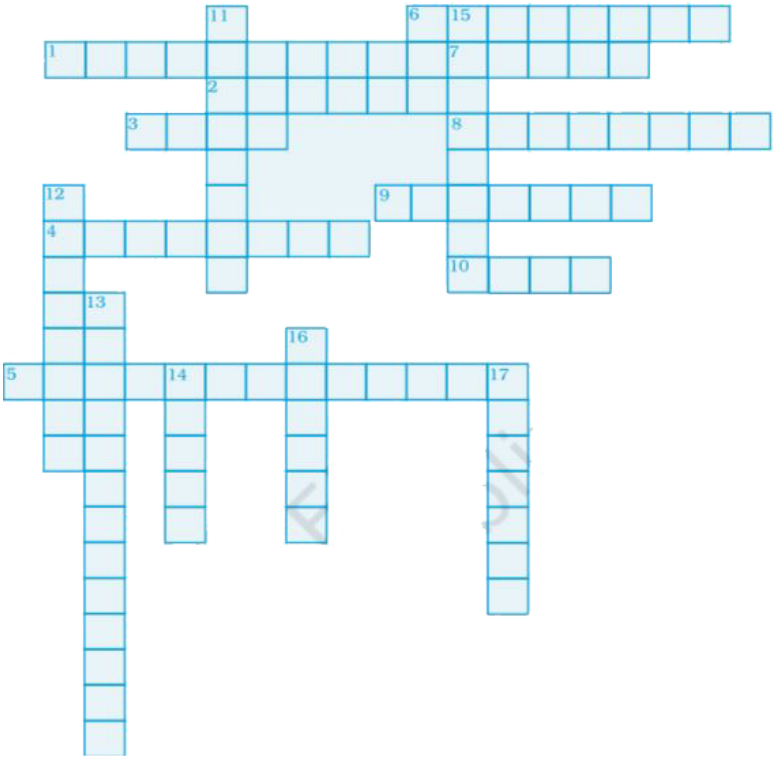
13. A _____ is a quadrilateral whose pair of opposite sides are parallel.

14. The diagonals of a rectangle are of _____ length.

15. A five sided polygon.

16. The diagonals of a parallelogram _____ each other.

17. A quadrilateral having all the properties of a parallelogram and also that of a kite.



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Think And Discuss

1. If RICE is a rhombus with EC = 20 cm and OC = 12 cm, can you find x, y, z ?

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2. Can you draw a rhombus ABCD if it's side is 13 cm and O is the point of intersection of diagonals

Given OA = 12 cm and OB = 5 cm ?

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