MATHS

BOOKS - MTG IIT JEE FOUNDATION

UNDERSTANDING QUADRILATERALS

Illustrations

1. Which of the following groups of angles can be the angles of a quadrilateral?

a. $70^\circ, 80^\circ, 90^\circ, 120^\circ$

b. $75^\circ, 65^\circ, 115^\circ, 125^\circ$

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2. Three angles of a quadrilateral are $30^\circ, 150^\circ$ and 100°. Find the fourth angle.

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3. The angles of a quadrilateral are in the ratio 5:3:9:7. Find the angles.

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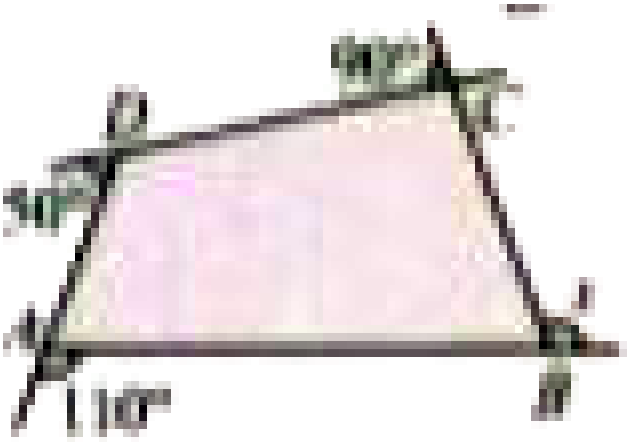
4. Find the value of x in the given figure.



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5. How many sides does a regular polygon have if the measure of an exterior angle is 24^\circ

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6. Two adjacent angles of a parallelogram are equal. What is the measure of each?

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7. RENT is a rectangle. Its diagonals meets at O. Find x if $OR = 2x + 3$ and $OT = 3x + 2$.

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8. If the length of a diagonal of square is 6cm. Find the length of the side of the square.

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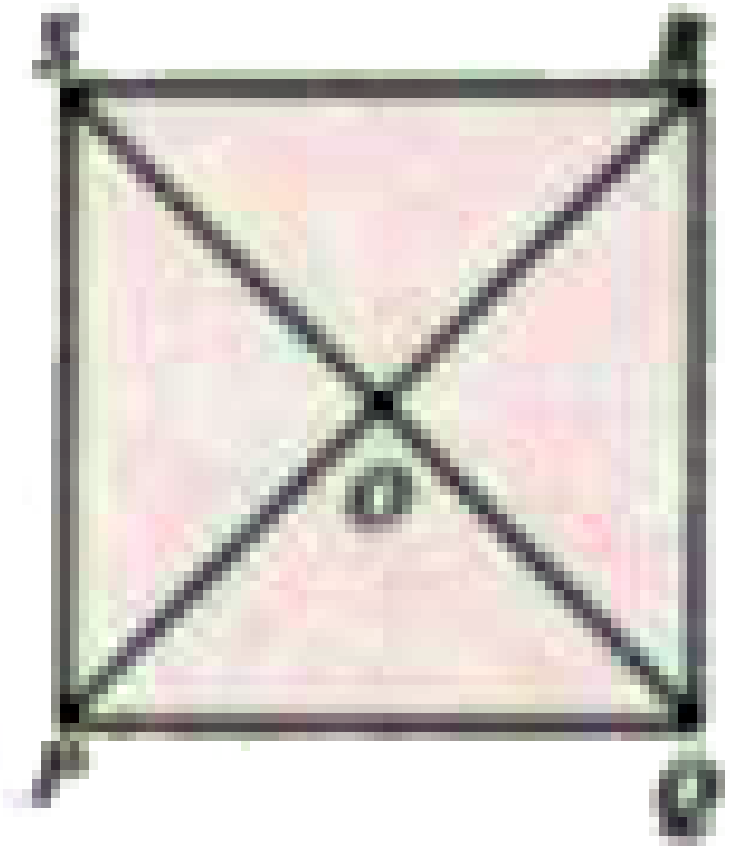
9. PQRS is a square. PR and SQ intersect at O. State the measure of $\angle POQ$.



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10. The adjacent figure $PQRS$ is a trapezium in which $SPRQ$, find the measures of $\angle P \, and \, \angle R$.

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11. ABCD is a trapezium in which $AB \| DC$ and $\angle A = \angle B = 40^\circ$. Find $\angle C$ and $\angle D$. Are these angles equal?

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Solved Examples

1. The angles of a quadrilateral are $100^\circ, 98^\circ$ and 92° respectively. Find the fourth angle.

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2. The four angles of a quadrilateral are in the ratio 2:3:5:5. Find the angles.

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3. The measures of two angles of a quadrilateral are 70° and 90° and the other two angles are equal. Find the measure of each of the equal angles.

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4. One angle of a quadrilateral is 99° and the remaining three angles are equal. Find the three equal angles.

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5. Find the measure of each interior angle of a regular polygon is 15 sides.

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6. The perimeter of a parallelogram is 150 cm. One of its side is greater than the other by 25 cm. Find the lengths

of all the sides of the parallelogram.

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7. In a quadrilateral PQRS: $\angle P = 80^\circ, \angle Q = 90^\circ$, $\angle R = 65^\circ$. Find the measure of $\angle S$. Is it a convex or concave quadrilateral?

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8. The diagonals of a rhombus are 10 cm and 24 cm. Find the length of a side of the rhombus.

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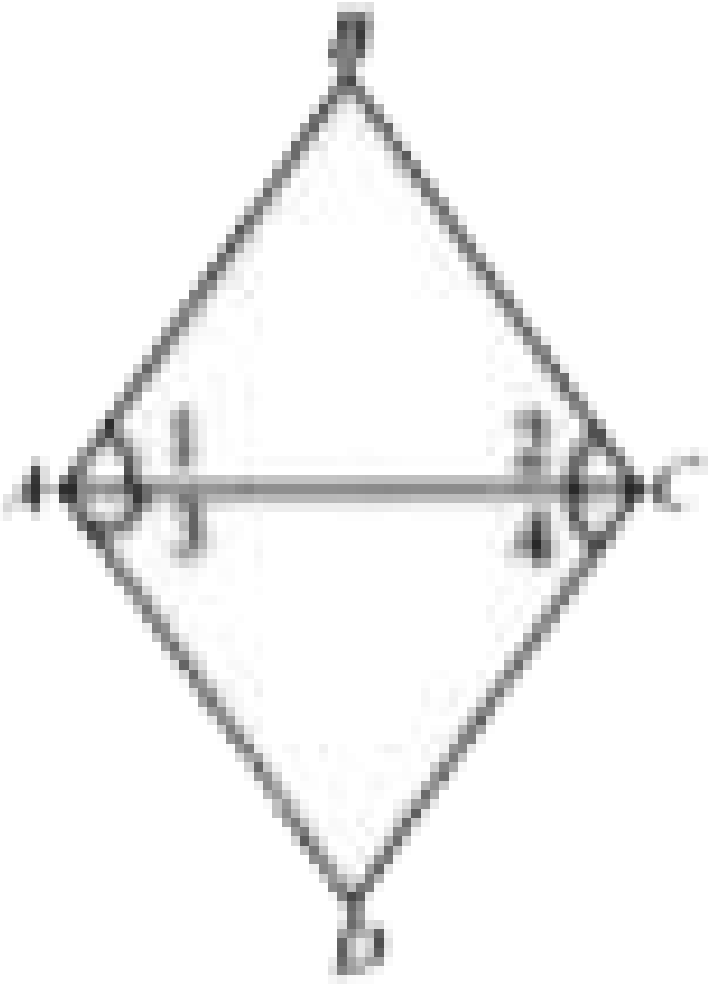
9. Diagonal AC of a rhombus ABCD is a equal to one of its sides BC. Find all the angles of the rhombus.



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10. The length of a rectagle is 4 cm and each of its diagonals measures 5 cm. Find its breadth.

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11. RING is a parallelogram as shown in the figure. If $\angle R = 70^\circ$, find all other angles.

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12. Prove that the interior angle of a regular pentagon is three times exterior anles of a regular decagon.

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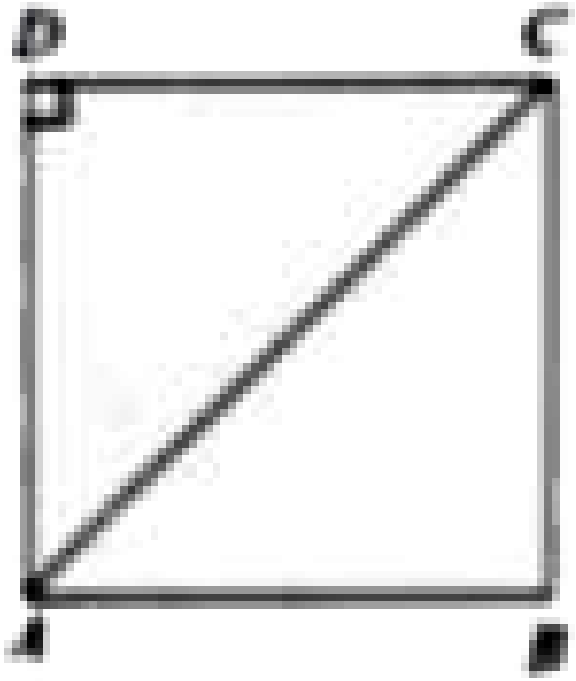
13. In the the give ABCD is a square. Find the measure of /_CAD.



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14. If the length of a diagonal of a square is 8 cm. Find the length of the side of the square.

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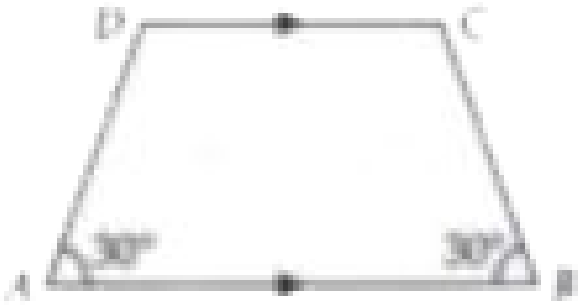
15. ABCD is a trapezium in which $AB \| DC$ $\angle A = \angle B = 30 degree$. Find $\angle C$ and $\angle D$. Are these angles equal?



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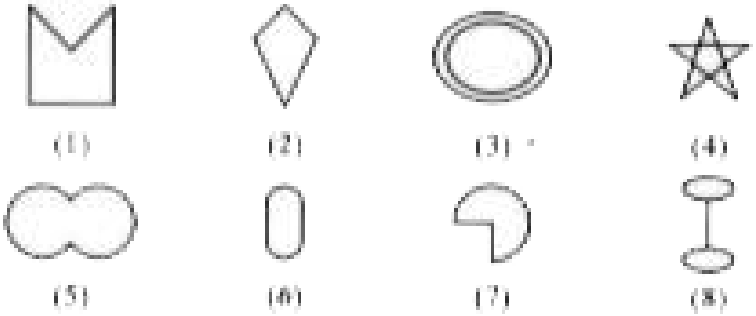
Ncert Section Exercise 3 1

1. Given here are some figures:



Classify each of them on the basis of the following:

a. Simple curve

b. Simple closed curve

c. Polygon d. Convex polygon

e. Concave polygon.

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2. How many diagonals does each of the following have?

a. A convex quadrilateral

b. a regular hexagon c. A triangle.

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3. What is the sum of the measures of the angles of a convex quadrialteral? Will this property hold if the quadrilateral is not convex? (Make a non convex quadrilateral and try!)

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4. Examine the table. (Each figure is divided into triangles and the sum of the angles deduced from that).

Figure				
Side	3	4	5	6
Angle sum	$180°$	$2 \times 180°$ $= (4-2) \times 180°$	$3 \times 180°$ $= (5-2) \times 180°$	$4 \times 180°$ $= (6-2) \times 180°$

What can you say about the angle sum of a convex polygon with number of sides 7, 8, 9?

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5. What is a regular polygon? State the name of a regular polygon of

(i) 3 sides (ii) 4 sides (iii) 6 sides

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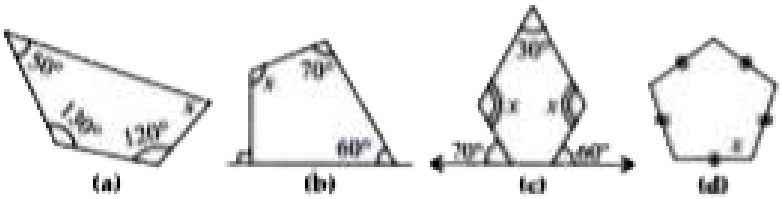
6. Find the angle measure x in the following figures.



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7. Find a. $x + y + z$ b. Find $x + y + z + w$.

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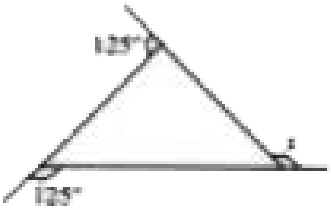
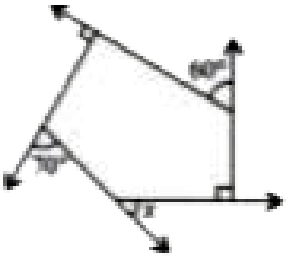
Ncert Section Exercise 3 2

1. Find x in the following figures:



(a)



(b)

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2. Find the measure of each exterior angle of a regular polygon of

(i) 9 sides

(ii) 15 sides

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3. How many sides does a regular polygon have if the measure of an exterior angle is 24°?

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4. How many sides does a regular polygon have if each of its interior angles is  165^\circ

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5. a. Is it possible to have a regular polygon with measure of each exterior angle as 22°?

b. Can it be an interior angle of a regular polygon? Why?

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6. a. What is the minimum interior angle possible for a regular polygon ? Why?

b. What is the maximum exterior angle possible for a regular polygon?

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Ncert Section Exercise 3 3

1. Given a parallelogram ABCD. Complete each statement along with the definition or property used. (i)

AD{\rm{ }} = {\rm{ }}.....

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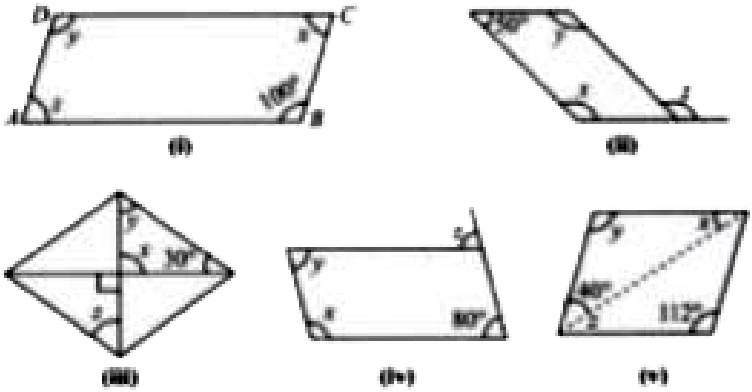
2. Consider the following parallelgorams. Find the value of the unknows x,y,z.



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3. Can a quadrilateral ABCD be a parallelogram if

(i) $\angle D + \angle B = 180^\circ$?

(ii) $AB = DC = 8cm$, $AD = 4cm$ and $BC = 4.4cm$?

(iii) $\angle A = 70^\circ$ and $\angle C = 65^\circ$?

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4. Draw a rough figure of a quadrilateral that is not a parallelogram but has exactly two opposite angles of equal measure.

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5. The measures of two adjacent angles of a parallelogram are in the ratio 3 : 2. Find the measure of each of the angles of the parallelogram.

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6. Two adjacent angles of a parallelogram have equal measure. Find the measure of each of the angles of the parallelogram.

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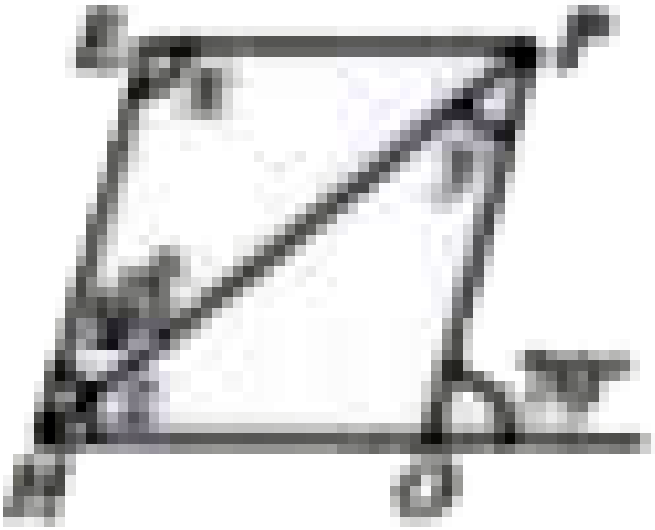
7. The given figure HOPE is a parallelogram. Find the angle measures x,y and z. State the properties you use to find

them.



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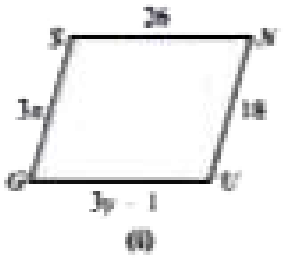
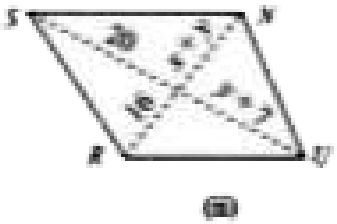
8. The following figures GUNS and RUNS are parallelograms. Find x and y. (Length are in cm).





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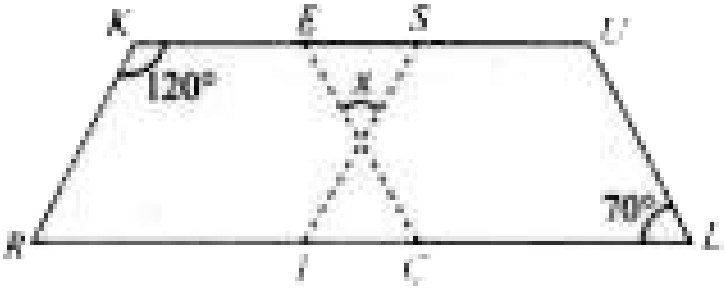
9. In the given figure btoh RISK and CLUE are parallelograms. Find the value of x.



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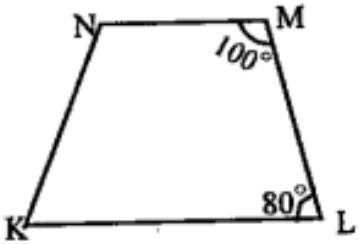
10. Explain how this figure is a trapezium. Which of its two sides are parallel?



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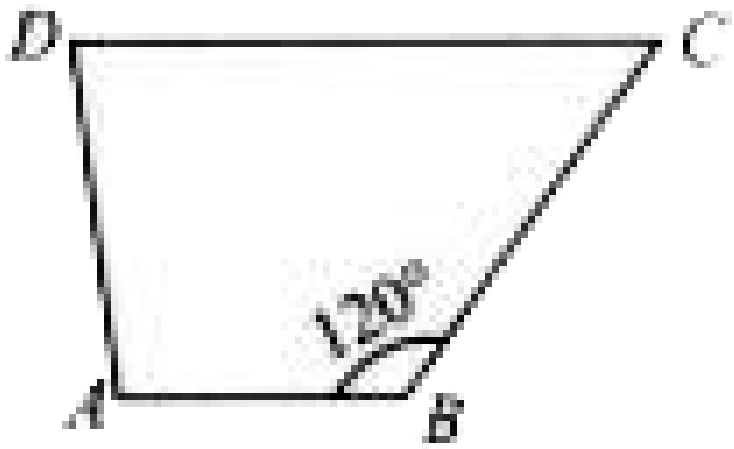
11. Find $m\angle C$ in the given figure if $\overline{AB} \parallel \overline{DC}$.



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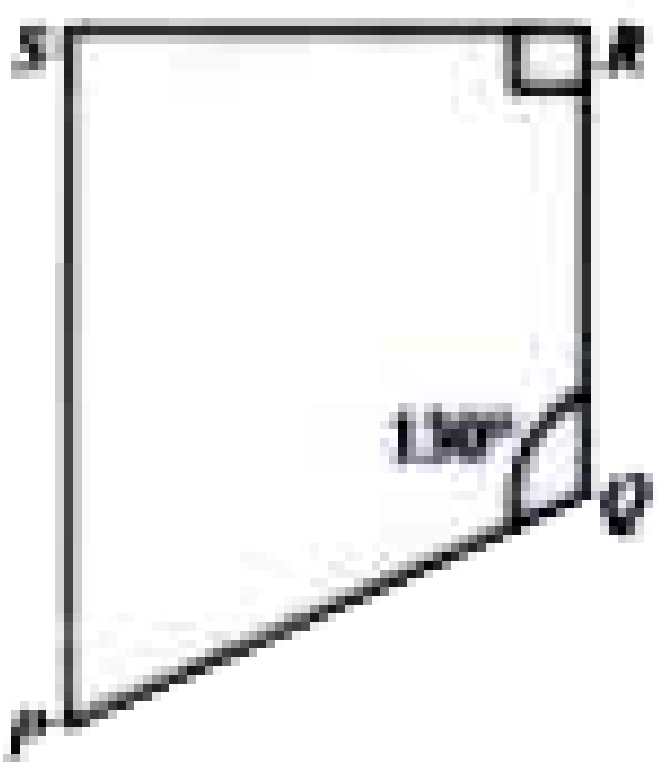
12. Find the measure of $\angle P$ and $\angle S$ if $\overline{SP} \parallel \overline{QR}$ in figure.



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Ncert Section Exercise 3 4

1. State whether True or False.

All rectangles are squares.

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2. State whether True or False.

All rhombuses are parallelograms

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3. State whether True or False.

All squares are rhombuses and also rectangles.

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4. State whether True or False.

All squares are not parallelograms.

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5. State whether True or False.

All kites are rhombuses.

Watch Video Solution

6. State whether True or False.

All rhombuses are kites.

Watch Video Solution

Watch Video Solution

7. State whether True or False.

All parallelograms ae trapezium.

Watch Video Solution

8. State whether True or False.

All squares are trapeziums.

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9. Identify all the quadrilaterals that have

a. four sides of equal length.

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10. Identify all the quadrilaterals that have. four sides of equal length

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11. Explain how a square is a quadrilateral

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12. Explain how a square is

a parallelogram

Watch Video Solution

13. Explain how a square is

a rhombus

Watch Video Solution

14. Explain how a square is

a rectangle

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15. Name the quadrilaterals whose diagonals

(i) bisect each other.

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16. Name the quadrilaterals whose diagonals

are perpendicular bisectors of each other.

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17. Name the quadrilaterals whose diagonals

are equal

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Watch Video Solution

18. Explain why a rectangle is a convex quadrilateral.

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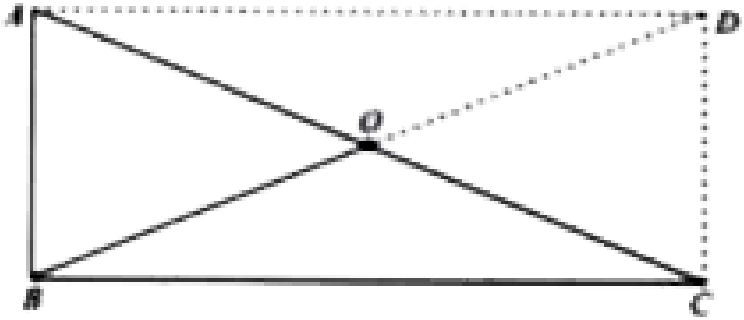
19. ABC is a a right angled triangle and O is the mid point of the side opposite to the right angle. Explain Why O is equidistant from A,B and C. (The dotted lines are drawn additionally to help you).



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Exercise Multiple Choice Question Level 1

1. The two diagonals are not necessarily equal in a

A. rectangle

B. square

C. rhombus

D. isosceles trapezium

Answer:

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2. The lengths of the diagonals of a rhombus are 16 cm and 12 cm . The length of each side of the rhombus is

A. 8cm

B. 9cm

C. 10cm

D. 12cm

Answer:

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3. Two adjacent angles of a parallelograms are $(2x + 25)^\circ$ and $(3x - 5)^\circ$. The value of x is

A. 28

B. 32

C. 36

D. 42

Answer:

Watch Video Solution

4. The diagonals do not necessarily intersect at right angles in a

A. parallelogram

B. trapezium

C. rhombus

D. kite

Answer:

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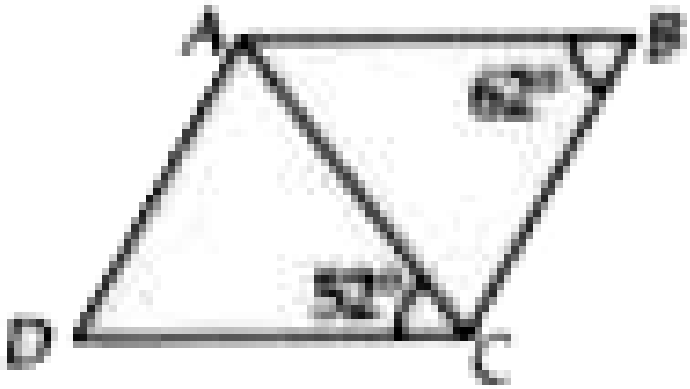
5. In the given quadrilateral ABCD (not drawn to scale) $BC = AC = AD$. Find the sum of $\angle DAC$ and $\angle ACB$.



A. 76°

B. 132°

C. 56°

D. 112°

Answer:

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6. If an angle of a parallelogram is two-thirds of its adjacent angle, the smallest angle of the parallelogram is

A. 54°

B. 72°

C. 81°

D. 108°

Answer:

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7. The diagonals do not necessarily bisect the interior angles at the vertices in a

A. rectangle

B. square

C. rhombus

D. None of these

Answer:

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8. In a square ABCD, AB=(2x+3) cm and BC=(3x-5) cm . Then , the value of x is

A. 5

B. 7

C. 6

D. 8

Answer:

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

A quadrilateral can have all four angles as obtuse.

A. 4 acute angles

B. 4 obtuse angles

C. 3 obtuse angles

D. 2 acute angles and 2 obtuse angles

Answer:

Watch Video Solution

10. An isosceles trapezium has

A. are unequal

B. are equal

C. intersect at right angles

D. None of these

Answer:

Watch Video Solution

11. The quadrilateral in which only one pair of opposite sides are parallel is called a

A. rectangle

B. kite

C. trapezium

D. rhombus

Answer:

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12. A quadrilateral, which is both a rectangle and a rhombus is a

A. square

B. parallelogram

C. kite

D. trapezium

Answer:

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13. Adjacent angles of a parallelogram are _____.

A. equal

B. complementary

C. supplementary

D. None of these

Answer:

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

A. equailateral

B. equiangular

C. both a and b

D. None of these

Answer:

Watch Video Solution

15. In a parallelogram if each angle is equal then it is called a

A. square

B. rectangular

C. rhombus

D. both a and b

Answer:

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16. The angles of a quadrilateral are in the ratio 1 : 2 : 3 : 4.

The smallest angle is

A. 36°

B. 72°

C. 144°

D. None of these

Answer:

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17. Three angles of a quadrilateral are in the ratio 1:5:6. The mean of these angles is 64°. Find the fourth angle.

A. 168°

B. 162°

C. 120°

D. 90°

Answer:

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18. In the adjoining figure, ABC is a parallelogram. The $\angle ABD$ is

A. 35°

B. 40°

C. 80°

D. 25°

Answer:

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19. The sum of all angles of a quadrilateral is

A. 180°

B. 270°

C. 300°

D. 360°

Answer:

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

A. 0°

B. 90°

C. 180°

D. 360°

Answer:

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21. Which of the following is a false statement for a parallelogram?

A. Opposite sides are equal

B. Opposite angles are equal

C. Diagonals bisect each other.

D. Diagonals bisect each other at right angles.

Answer:

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22. Which of the following statements are true for a rectangle? It has two pairs of equal sides. It has all its

sides of equal length. Its diagonals are equal. Its diagonals bisect each other. Its diagonals are perpendicular. Its diagonals are perpendicular and bisect each other. Its diagonals are equal and bisect each other. Its diagonals are equal and perpendicular, and bisect each other. All rectangles are squares. All rhombuses are parallelograms. All squares are rhombuses and also rectangles. All squares are not parallelograms.

A. All rectangles are squares.

B. Its diagonals are perpendicular.

C. Its diagonals are equals

D. all sides are equal.

Answer:

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23. Which of the following statements is false for a square?

A. It is a rectangle

B. It has all its sides of equal length.

C. All squares are not parallelograms.

D. Its diagonals bisects other at right angles.

Answer:

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24. Identify all the quadrilaterals that have

a. four sides of equal length.

A. Rhombus

B. rectangular

C. Parallelogram

D. Kite

Answer:

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25. In which quadrilateral diagonals bisect each other at right angles?

A. parallelogram

B. Rectangle

C. Square

D. Kite

Answer:

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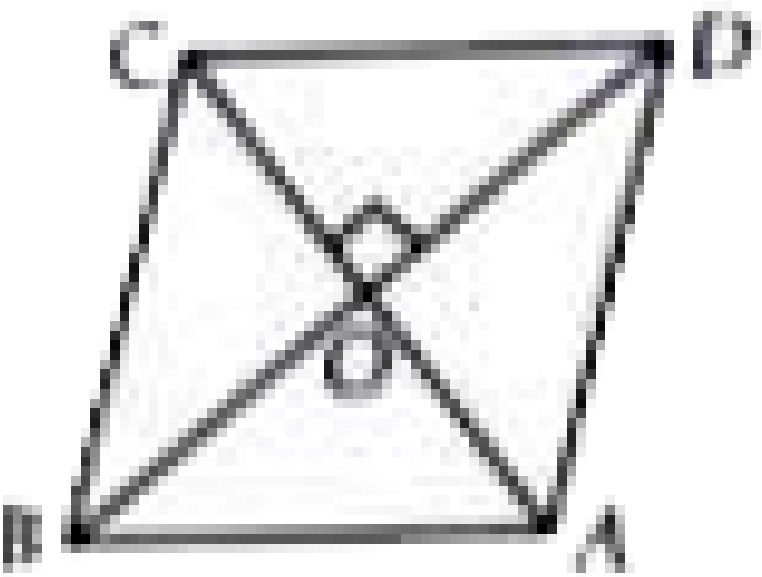
26. In the given figure ABCD is a rhombus with $\angle ABC = 56^\circ$. Determine $\angle ACD$



A. 28°

B. 26°

C. 62°

D. 80°

Answer:

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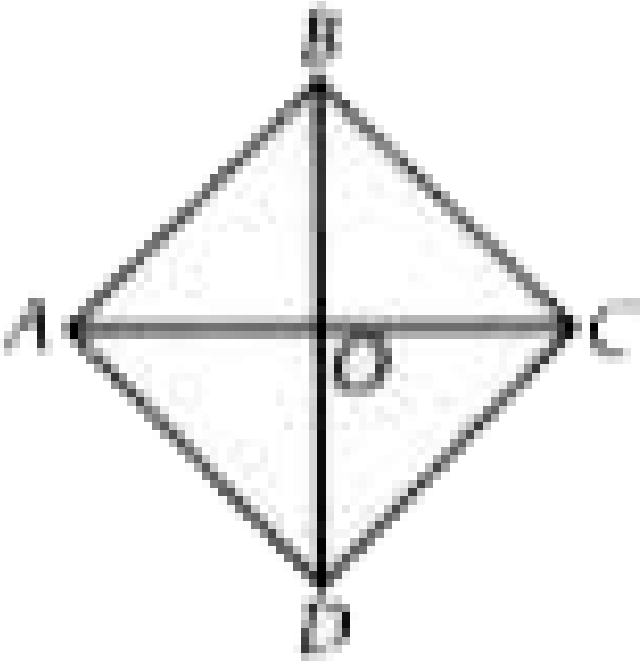
27. If ABCD is a rhombus and BO=3 and AO=4cm, then find the length of each side of rhombus.



A. 5cm

B. 25cm

C. 10cm

D. 15cm

Answer:

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28. If the diagonals of a rhombus are 30 cm and 40 cm, then the length of each side of rhombus is

A. 20cm

B. 22cm

C. 25cm

D. 45cm

Answer:

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29. In a parallelogram $ABCD$, the bisectors of $\angle A \; and \; \angle B$ meet at O. Find $\angle AOB$.

A. 45°

B. 30°

C. 60°

D. 90°

Answer:

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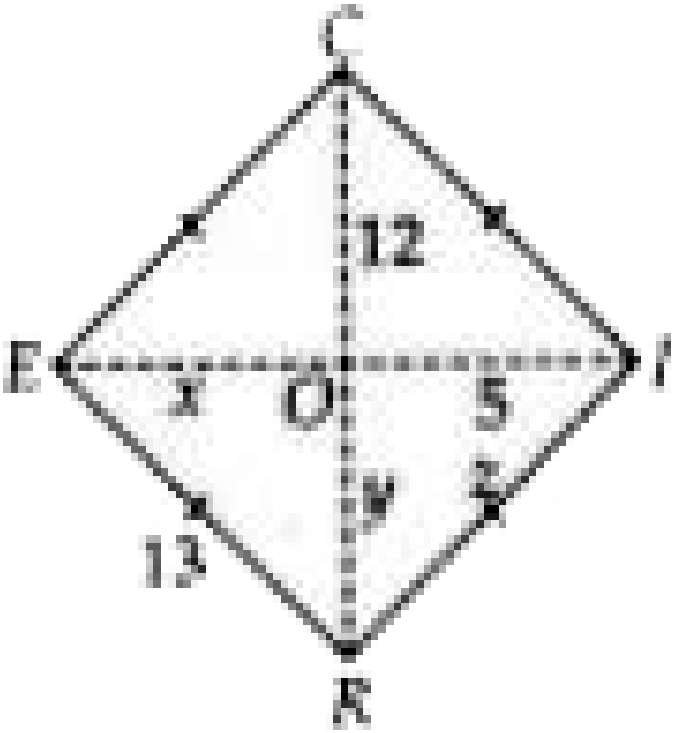
30. In the given figure RICE is a rhombus. Find $x + y + z$



A. 30

B. 35

C. 25

D. 20

Answer:

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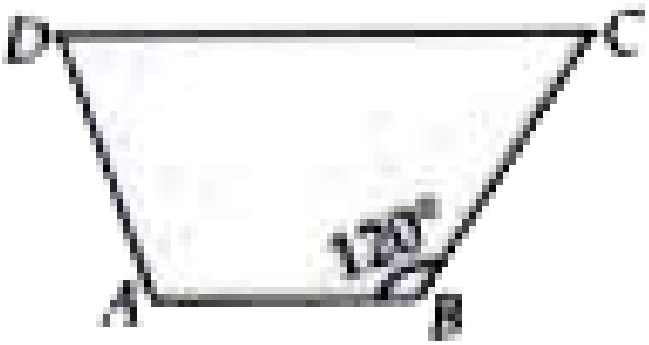
31. In the following figure ABCD is a trapezium in which $AB \| DC$. Find the measdure of $\angle C$.



A. 120°

B. 60°

C. 100°

D. 80°

Answer:

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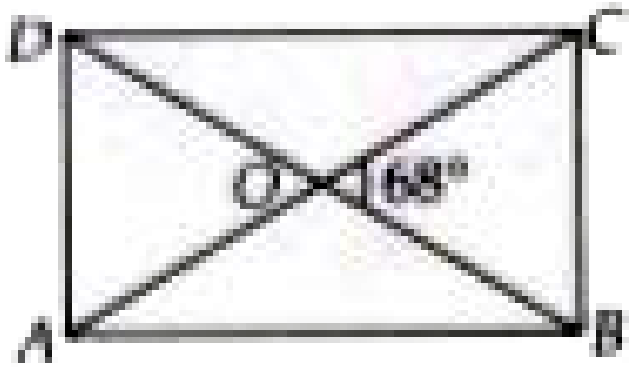
32. The diagonals of a rectangular ABCD intersect at O. If $\angle BOC = 68^\circ$, then find $\angle ODA$



A. 28°

B. 56°

C. 112°

D. 68°

Answer:

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33. In the given figure ABD and BCD are isosceles triangles, where AB=BC=BD. The special name that is given to

quadrilateral ABCD is

A. rectangle

B. Rhombus

C. Parallelogram

D. trapezium

Answer:

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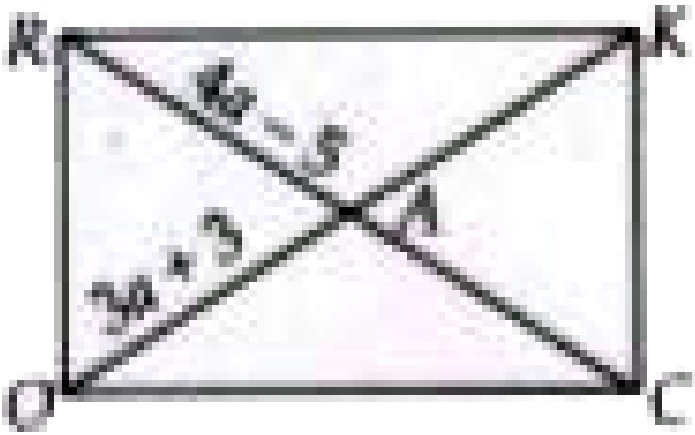
34. ROCK is a rectangle. Its diagonals meet at A. Find a if $RA = 4a - 5$ and $OA = 3a + 3$.



A. 3

B. 5

C. 8

D. 4

Answer:

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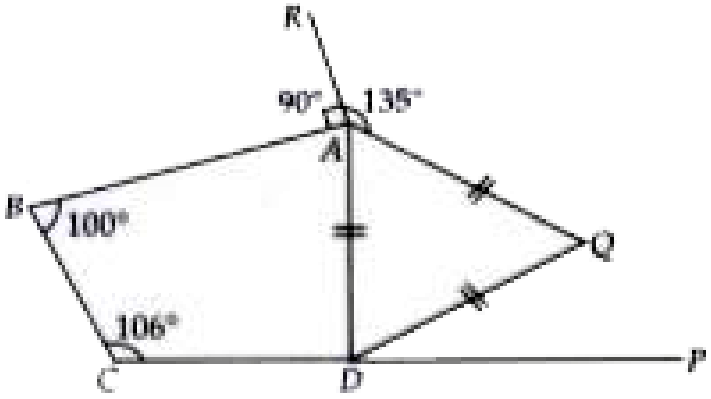
35. In the given figure CDP is a straight line ΔAQD is an equilateral triangle $\angle BAR = 90^\circ, \angle QAR = 135^\circ, \angle BCD = 106^\circ$ and $\angle ABC = 100^\circ$. Then, $\angle PDQ$ equals



A. 39°

B. 21°

C. 41°

D. 53°

Answer:

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Exercise Multiple Choice Question Level 2

1. Which of the following statements is false for a rhombus?

A. It has two pairs of equal sides.

B. Its diagonals bisect each other at right angles.

C. It is a parallelogram

D. Two of its angles are right angles.

Answer:

2. The length and breadth of a rectangle are in the ratio 4:3. If the diagonal measures 25 cm then the perimeter of the rectangle is

A. 56cm

B. 60cm

C. 70cm

D. 80cm

Answer:

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3. If one angle of a parallelogram is 24° less than twice the smallest angle then the largest angle of the parallelogram is

A. 68°

B. 102°

C. 112°

D. 176°

Answer:

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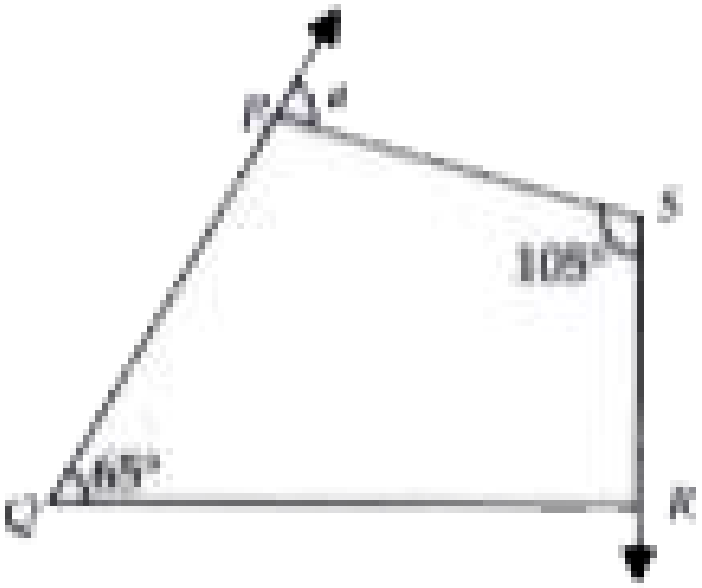
4. In the adjacent figure, angle P and angle R are in the ratio 3:7, then the value of a is



A. 47°

B. 57°

C. 123°

D. None of these

Answer:

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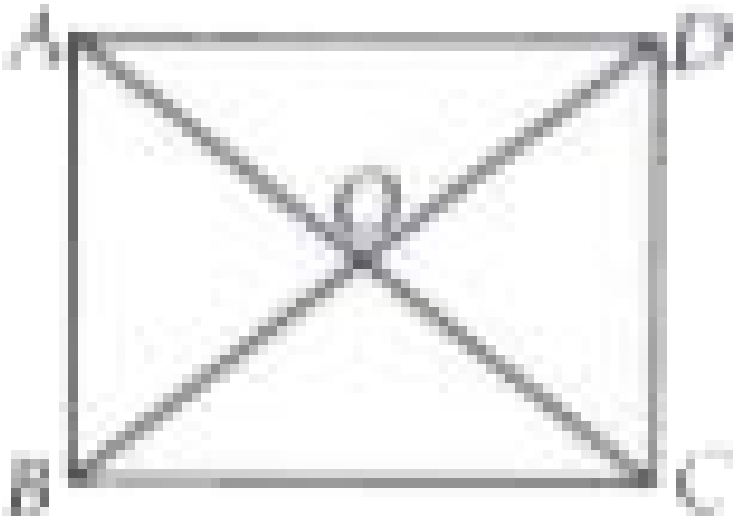
5. In a rectangle ABCD, the diagonals intersect at O.If $\angle AOB = 62^\circ$, then $\angle ODC =$



A. 39°

B. 59°

C. 48°

D. None of these

Answer:

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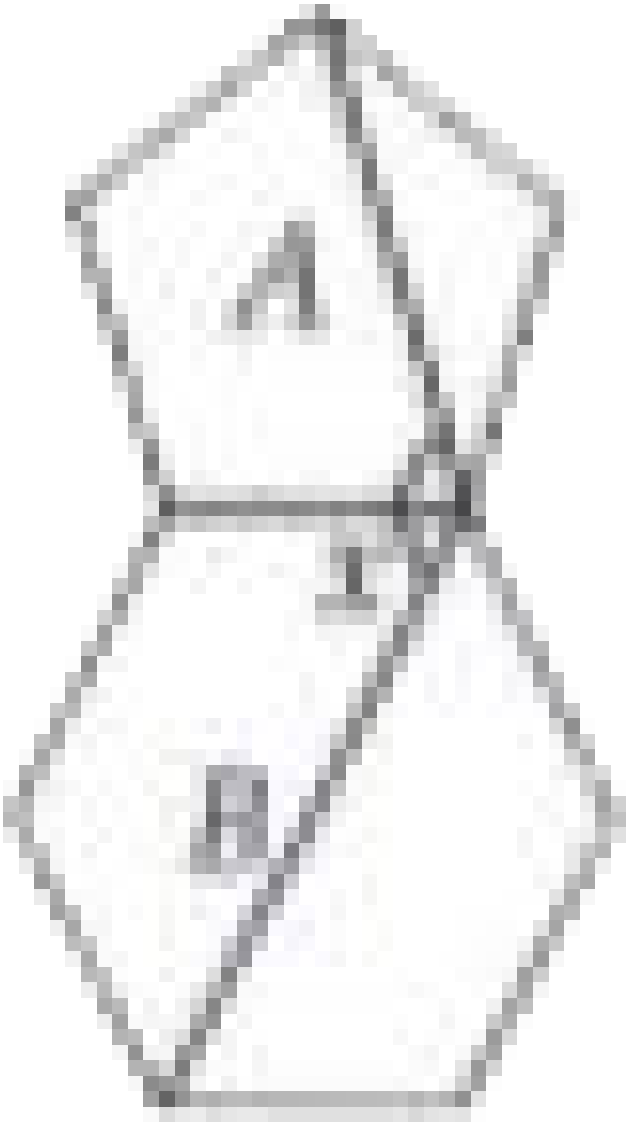
6. Polygon A is a regular pentagon and polygon B is a regular hexagon. Find the value of x.



A. 108°

B. 132°

C. 124°

D. 96°

Answer:

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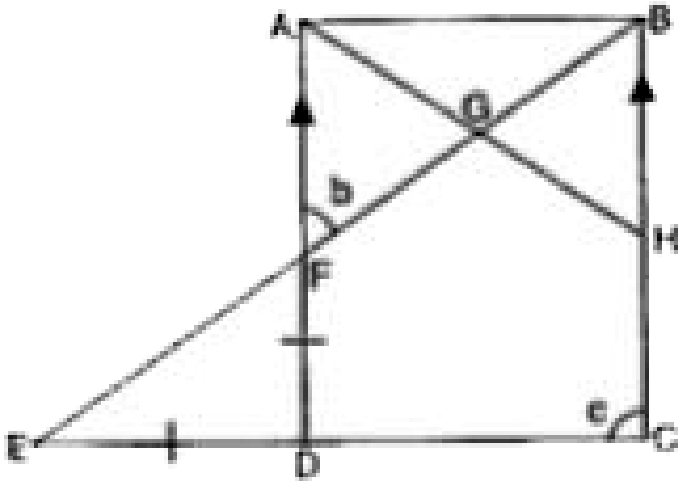
7. In the given figure, AD||BC, $\angle AFG = b$ and $\angle BCD = c$. Express b in terms of c.



A. $c/2$

B. $\frac{90^\circ + c}{2}$

C. $180^\circ - c/2$

D. $90^\circ - c/2$

Answer:

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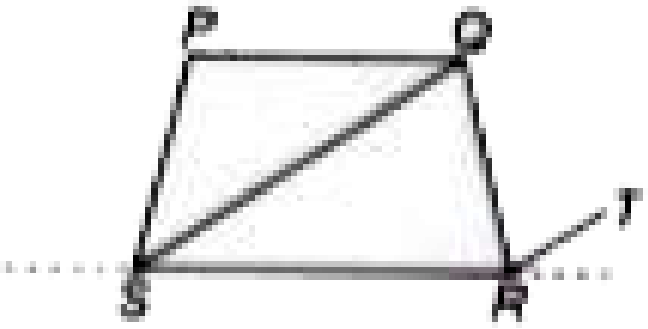
8. In the given figure line RT is drawn parallel to SQ. If $\angle QPS = 100^\circ, \angle PQS = 40^\circ, \angle PSR = 85^\circ$ and

$\angle QRS = 70^\circ$, then $\angle QRT =$



A. 45°

B. 65°

C. 85°

D. 90°

Answer:

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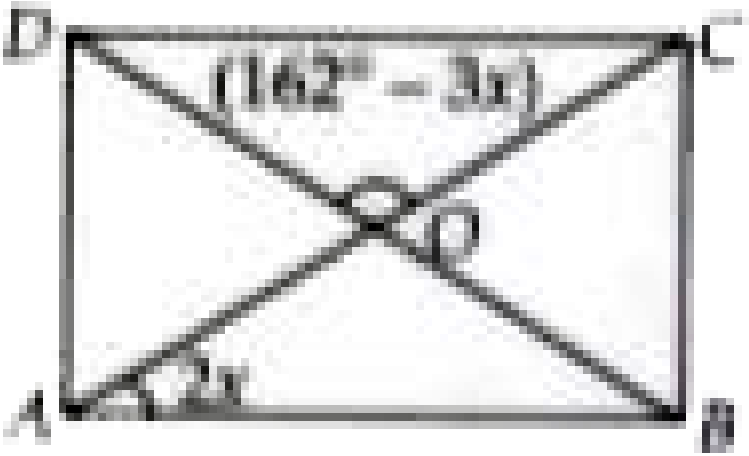
9. ABCD is a rectangle. Find the value of x.



A. 54°

B. 36°

C. 24°

D. 18°

Answer:

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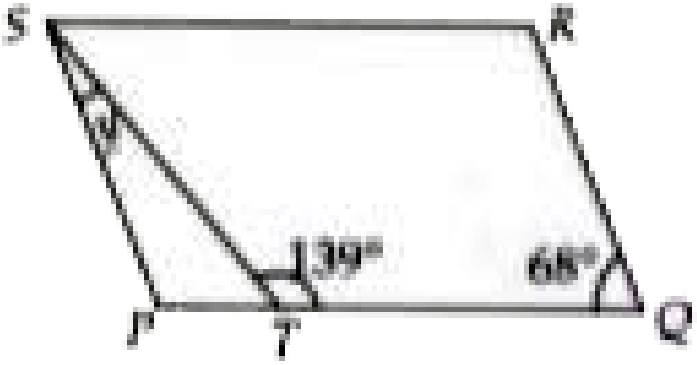
10. If PQRS is a parallelogram, then y equals



A. 27°

B. 61°

C. 41°

D. 28°

Answer:

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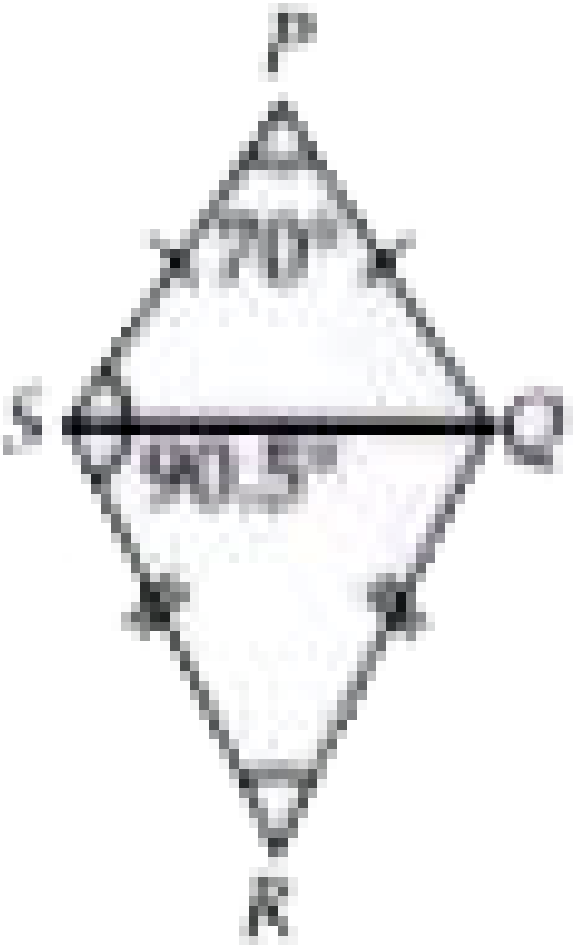
11. PQRS is a kite.If $\angle P = 70^\circ$ and $\angle S = 90.5^\circ$,then $\angle R$ equals



A. 99°

B. 91°

C. 111°

D. 109°

Answer:

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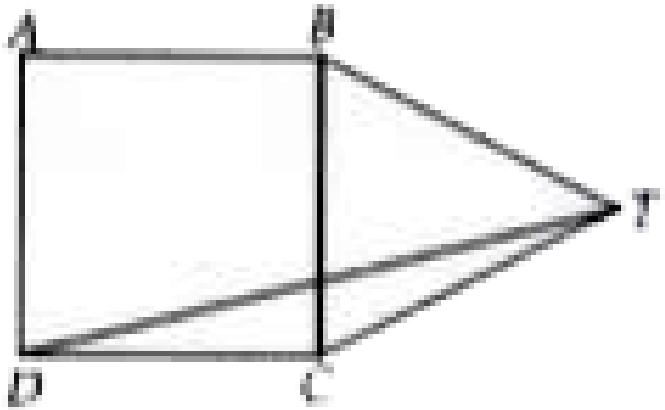
12. In the given figure, ABCD is a square and ΔBCT is an equilateral triangle. Find $\angle BTD$.



A. 30°

B. 15°

C. 45°

D. 35°

Answer:

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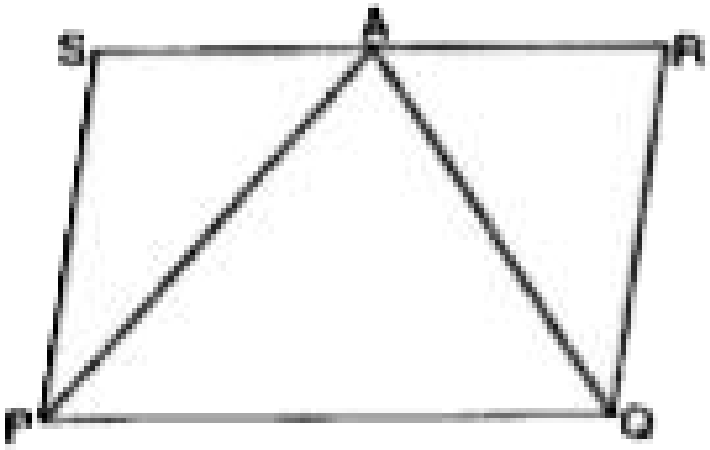
13. In the given figure, PQRS is a parallelogram and $\angle SPQ = 60^\circ$. If the bisectors of $\angle P$ and $\angle Q$ meet at A

on RS, then which of the following is not correct ?



A. AS=SP

B. AS=AR

C. AR=SP

D. AQ=PQ

Answer:

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Exercise Multiple Choice Question Level 2 Match The Following

1. Match the lists:

List-I	List-II
(P) Diagonals of a rectangle	(1) Bisect each other at right angles
(Q) Diagonals of a square	(2) Bisect each other
(R) Diagonals of a rhombus	(3) Equal and bisect each other
(S) Diagonals of a parallelogram	(4) Equal and bisect each other at right angles

A. P-1,Q-2,R-3,S-4

B. P-3,Q-4,R-1,S-2

C. P-4,Q-2,R-3,S-1

D. P-4,Q-3,R-2,S-1

Answer:

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Exercise Multiple Choice Question Level 2 Assertion And Reason Type

1. Assertion: The measure of each angle of a regular hexagon is 120°

Reason: Sum of all interior angles of a polygon of n sides is (n-2) right angles.

A. If both assertion and reason are true and reason is the correct explanation of assrtion.

B. If both assertinon and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true:

Answer:

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2. Assertion: The adjacent angles in a parallelogram are supplementary.

Reason: In a parallelogram the adjacent angles are always equal.

A. If both assertion and reason are true and reason is the correct explanation of assrtion.

B. If both assertinon and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true:

Answer:

3. Assertion: Every kite is a rhombus.

Reason: All sides are not equal in a kite.

A. If both assertion and reason are true and reason is the correct explanation of assrtion.

B. If both assertinon and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true:

Answer:

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4. Assertion: Diagonals of a rhombus bisect each other.

Reason: Even rhombus is a parallelogram and diagonals of parallelogram bisect each other.

A. If both assertion and reason are true and reason is the correct explanation of assrtion.

B. If both assertinon and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true:

Answer:

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5. Assertion: Every rectangle is a parallelogram.

Reason: Rectangle satisfies all the properties of parallelogram as opposite sides are equal and parallel, diagonals biseect each other and opposite angles are equal.

A. If both assertion and reason are true and reason is the correct explanation of assrtion.

B. If both assertinon and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true:

Answer:

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Exercise Multiple Choice Question Level 2 Comprehension Type

1. Passage I: The angle of a quadrilateral are in the ratio 3:5:7:9.

If measure of angles be (3x),(5x),(7x) and (9x), then the value of x is

A. 20°

B. 15°

C. 25°

D. 10°

Answer:

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2. The angles of a quadrilateral are in the ratio $3:5:7:9$.

Find the measure of each of these angles.

A. $45^\circ, 70^\circ, 105^\circ, 140^\circ$

B. $40^\circ, 80^\circ, 105^\circ, 135^\circ$

C. $45^\circ, 75^\circ, 110^\circ, 130^\circ$

D. $45^\circ, 75^\circ, 105^\circ, 135^\circ$

Answer:

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3. Passage I: The angle of a quadrilateral are in the ratio 3:5:7:9.

The sum of the least and greatest angle is

A. 175°

B. 180°

C. 170°

D. 185°

Answer:

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4. Passage II: Measure of each exterior angle of a regular polygon of n sides : $\left(\frac{360}{n}\right)^{\circ}$

The measure of each exterior angle of a 10 sided regular polygon is

A. 36°

B. 30°

C. 18°

D. 35°

Answer:

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5. Passage II: Measure of each exterior angle of a regular polygon of n sides : $\left(\frac{360}{n}\right)^{\circ}$

If measure of an exterior angle is 45°, the number of sides in a regular polygon is

A. 7

B. 11

C. 10

D. 8

Answer:

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6. What is the measure of an exterior angle of a regular polygon of 6 sides?

A. Octagon

B. Quadrilateral

C. Nonagon

D. Hexagon

Answer:

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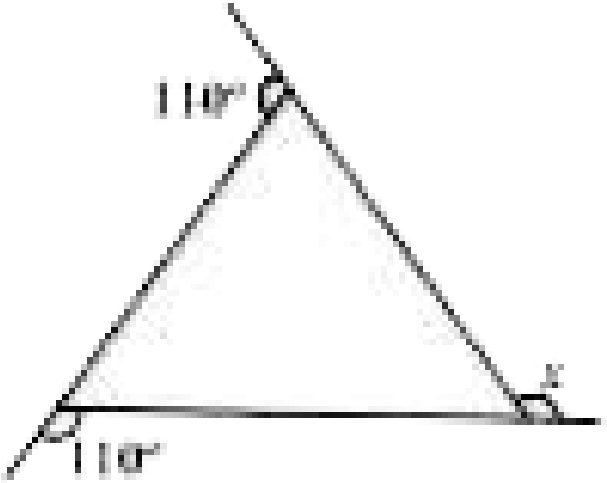
Exercise Multiple Choice Question Level 2 Subjective Problems

1. Find the measure of x in the given figure:



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2. In a quadrilateral $PQRS, \angle P = 70^\circ, \angle Q = 90^\circ, \angle R = 55^\circ$. Find the measure of $\angle S$. What kind of quadrilateral is it convex or concave?

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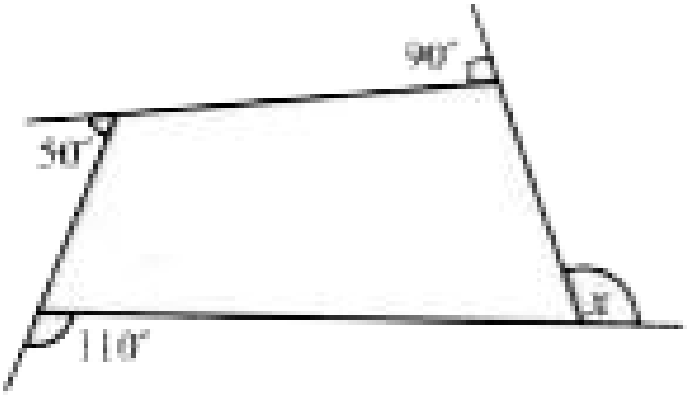
3. Find the measure of x



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4. Which of the following groups of angle can be the angles of a quadrilateral?

(i) $120^\circ, 90^\circ, 75^\circ, 30^\circ$

(ii) $100^\circ, 100^\circ, 70^\circ, 90^\circ$

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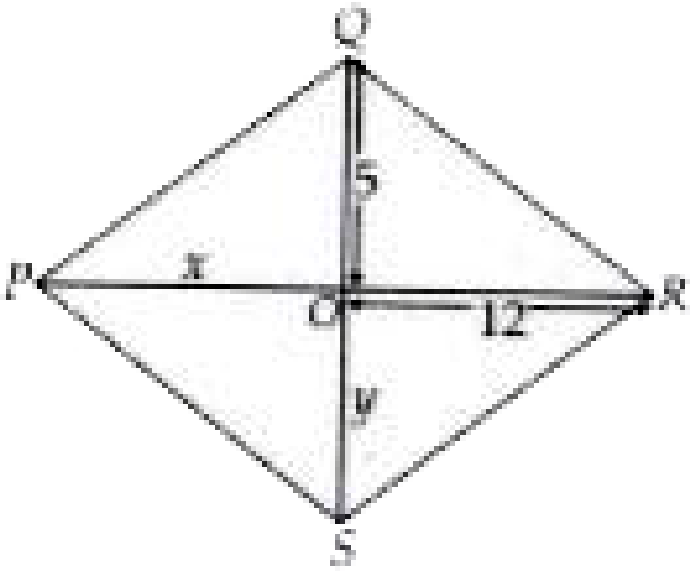
5. Let PQRS be a rhombus, find x,y



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6. In a quadrilateral $PQRS \angle P = 40^\circ, \angle Q = 60^\circ, \angle R = 60^\circ$. Find $\angle S$. Is this quadrilateral convex or concave?

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7. Adjacent angles of a parallelogram are in the ratio of 2:7. Find their values.

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8. In a parallelogram, two adjacent angles are supplementary.

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9. The diagonals of a quadrilateral are of lengths 6cm and 8cm. If the diagonals bisect each other at right angles, what is the length of each side of the quadrilateral?

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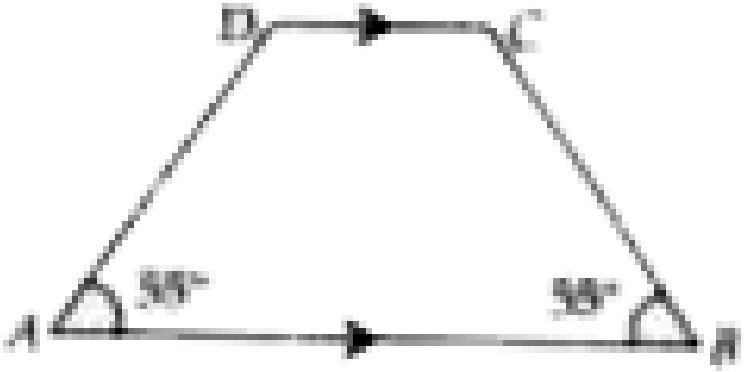
10. In the given figure find the measure of $\angle C$.



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11. Three angles of a quadrilateral are in the ratio 1:2:3. The mean of these angles is 32°. Find the four angles.

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12. Prove that in a rhombus with angles of 60°, the shorter diagonal divides it into two equilateral triangles.

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13. $ABCD$ is a rhombus whose diagonals intersect at O. If $AB = 10cm,$ diagonals $BD = 16\,cm$, find the length of

diagonal AC

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14. ABCD is a prallelogram in which $\angle A = 75^\circ$. Find the measure of each of the angles $\angle B$, $\angle C$ and $\angle D$.

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15. In Figure, $ABCD$ is a parallelogram in which $\angle DAB = 75^0 and \angle DBC = 60^0.$ Compute $\angle CDB \, and \, \angle ADB$

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16. In a parallelogram $ABCD$, $\angle D = 115^0$, determine the measure of $\angle A \; and \; \angle B$.

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17. Theratio of two sides of a rectagle is 3:5and its perimeter is 48m. Find the sides of the rectangle

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18. The interior angle of a regular polygon is 156^0. Find the number of sides of the polygon.

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19. Two adjacent sides of a rectangle are in the ratio 4:3. The perimeter of the rectangle is 210 m. Find the sides of the rectangle.

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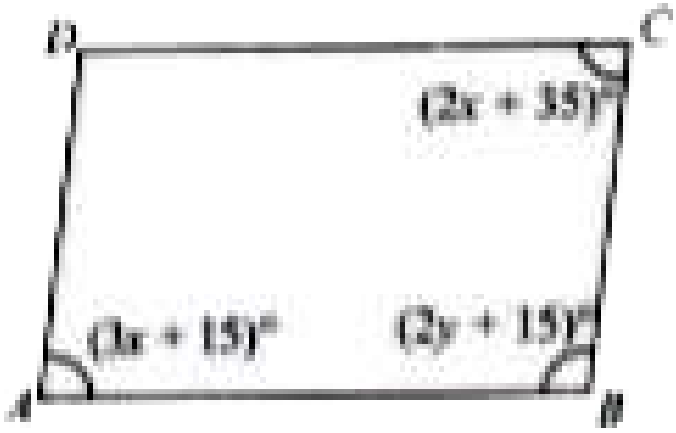
20. Consider a parallelogram ABCD in the figure. Find the value of x.



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

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22. The exterior angle of a regular polygon is one-third of its interior angle. How many sides has the polygon?

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23. In a quadrilateral $ABCD$, AO and BO are the bisectors of $A\angle$ and $\angle B$ respectively. Prove that $\angle AOB = \frac{1}{2}(\angle C + \angle D)$.

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24. In Figure, bisectors of $\angle B$ and $\angle D$ of quadrilateral $ABCD$ meet CD and AB produced at P and Q respectively. Prove that $\angle P + \angle Q = \frac{1}{2}(\angle ABC + \angle ADC)$.

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25. The diagonals of a rectangle $ABCD$ meet at O. If $\angle BOC = 44^0$, find $\angle OAD$.

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26. The number of sides of a polygon whose exterior and interior angles are in the ratio $1:5$ is k. The value of k is

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27. The ratio of two sides of a rectangle is 4:3 and its perimeter is 56 m. If the sides of rectangle be a and b. then $a + b$ (in m) is

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28. The number of sides in a decagon is $\frac{l+15}{2}$. The value of l is

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29. The measure of angles of a hexagon are $x^0,\ (x-5)^0,\ (x-5)^0,\ (2x-5)^0,\ (2x-5)^0,\ (2x+20)^0$.

Find the value of x.

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30. The number of sides of a regular polygon when each of its angle has a measure of 135° is

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31. Find the value of s,if the number of sides in an octagon is $\frac{s+5}{2}$.

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32. Find the number of sides of a regular polygon when each of its angle has a measure of 90°.

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33. The polygon with.....sides is called nonagon.

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34. The exterior and interior angles of n sides polygon are in the ratio 1:2. Find the number of sides.

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35. The measure of angle of a quadrilaterial are x, 2x, 3x and 4x. Find the value of $\frac{x}{12^\circ}$.

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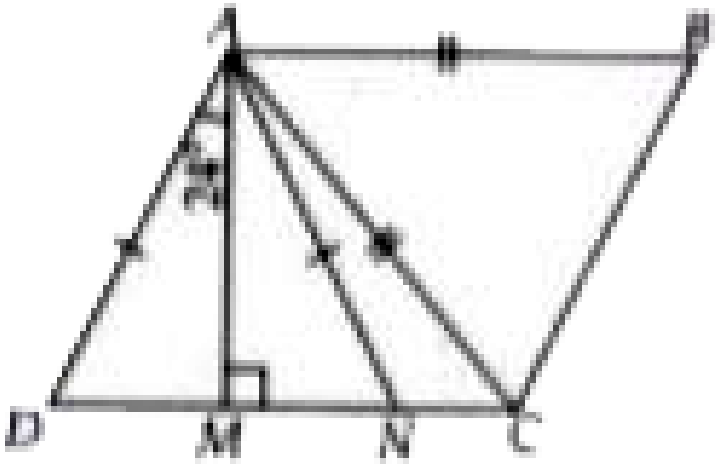
Olympaid Hots Corner

1. If ABCD is a parallelogram ΔADN and ΔABC are isosceles triangles, then find $\angle BAC$.



A. 112°

B. 140°

C. 48°

D. 32°

Answer:

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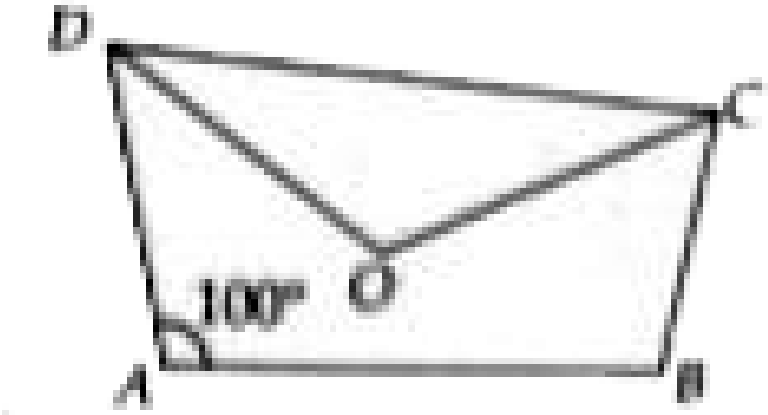
2. In the given figure DO and CO are the bisectors of $\angle ADC$ and $\angle BCD$ respectively. If $\angle ADC = \angle BCD = 60^\circ$ and $\angle DAB = 100^\circ$ find



$\angle DOC$ and $\angle ABC$

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

B. $110^\circ, 140^\circ$

C. $120^\circ, 140^\circ$

D. $140^\circ, 120^\circ$

Answer:

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3. The diagonals of a rectangle $ABCD$ meet at O. If $\angle BOC = 44^0$, find $\angle OAD$.

A. 120°

B. 68°

C. 90°

D. 44°

Answer:

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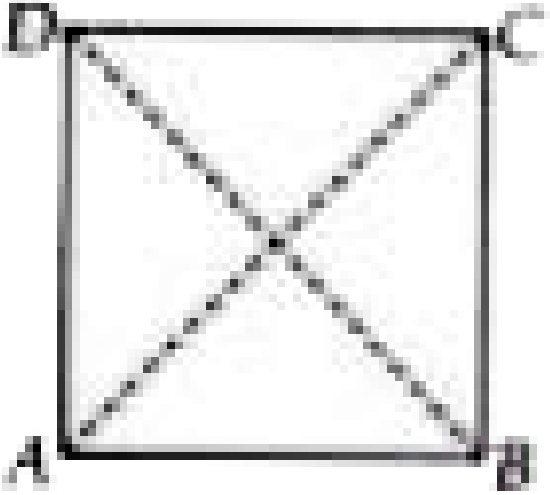
4. ABCD is a square of area of 4 square units which is divided into 4 non overlapping triangles as shown in figure, then sum of perimieters of the triangles so formed

is



A. $8\left(2+\sqrt{2}\right)$ units

B. $8\left(1+\sqrt{2}\right)$ units

C. $4\left(1+\sqrt{2}\right)$ units

D. $4\left(2+\sqrt{2}\right)$ units

Answer:

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5. Match the following

List-I		List-II
(P) Rectangle is	(i)	A quadrilateral having its opposite sides equal and parallel.
(Q) Square is	(ii)	A parallelogram having its opposite sides equal and each of the angle is a right angle.
(R) Parallel-ogram is	(iii)	A parallelogram having all sides equal and each of the angle is a right angle.
(S) Rhombus is	(iv)	A quadrilateral in which a pair of opposite sides are parallel.
(T) Trapezium is	(v)	A parallelogram having all the sides equal.

A. $P \rightarrow v, Q \rightarrow iv, R \rightarrow iii, S \rightarrow i, T \rightarrow ii$

B. $P \rightarrow i, Q \rightarrow ii, R \rightarrow iii, S \rightarrow iv, T \rightarrow v$

C. $P \rightarrow iii, Q \rightarrow ii, R \rightarrow v, S \rightarrow i, T \rightarrow iv$

D. $P \to ii, Q \to iii, R \to i, S \to v, T \to iv$

Answer: D

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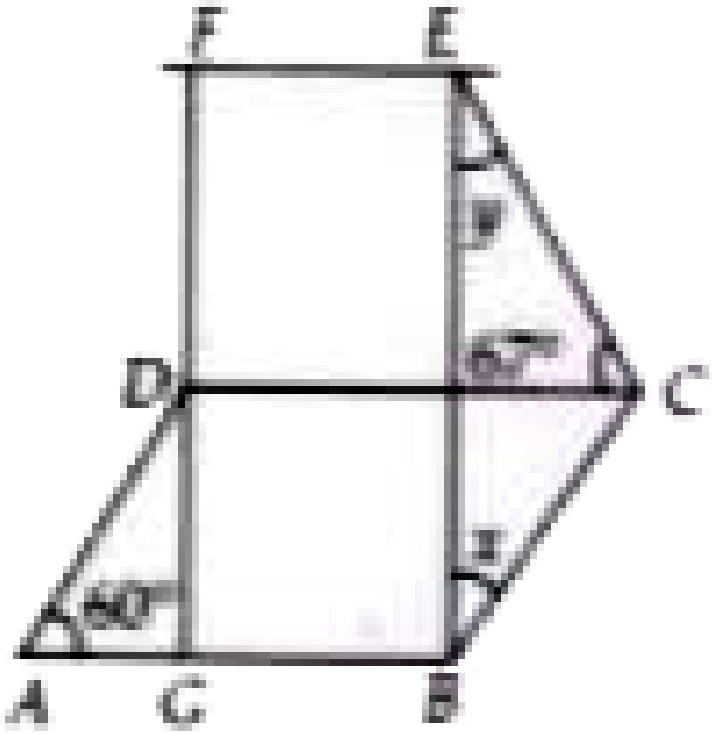
6. In the given figure (not drawn to scale), ABCD is a parallelogram and GBEF is a rectangle. Find



(i) x (ii) y

A. (i) 60° (ii) 47°

B. (i) 30° (ii) 23°

C. (i) 30° (ii) 67°

D. (i) 60° (ii) 30°

Answer:

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7. The measures of the five angles of a hexagon are equal and the sixth angle measures 100°, then the measure of each of the five angles is

A. 120°

B. 124°

C. 128°

D. 130°

Answer:

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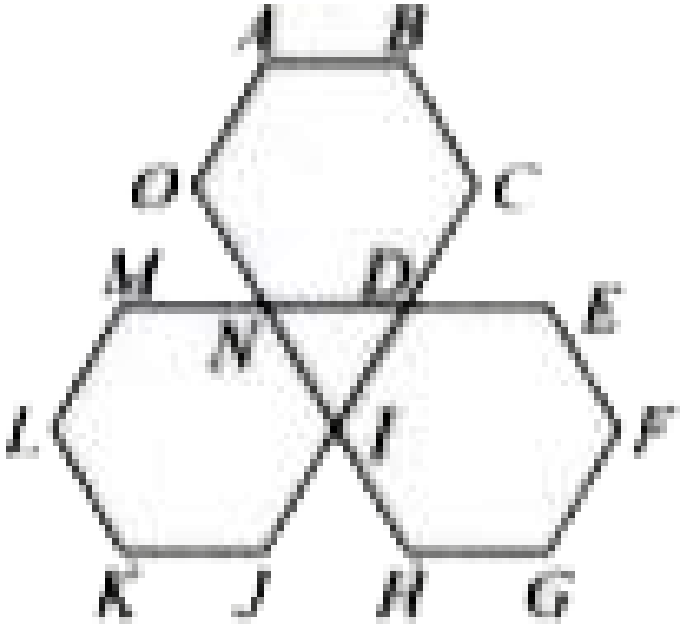
8. If the given figure is made up of 3 identical regular polygons, then find



(i) $\angle ABC$ (ii) $\angle DIN$

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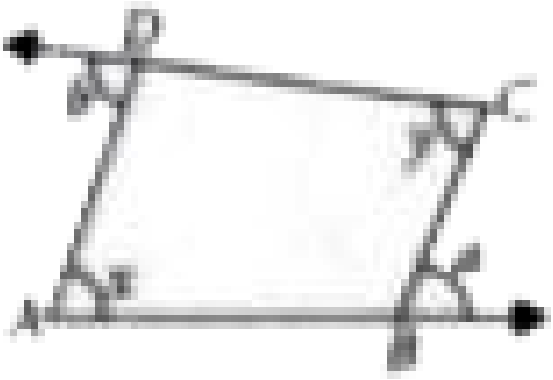
9. Sides AB and CD of a quadrilateral ABCD are extended as shown in the figure Then a+b is equal to



A. $x + 2y$

B. $x - y$

C. $x + y$

D. $2x + y$

Answer:

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10. In the given figure ABCD is a parallelogram. Then the values of x and y respectively are

A. $x = 60^\circ, y = 15^\circ$

B. $x = 45^\circ, y = 25^\circ$

C. $x = 25^\circ, y = 45^\circ$

D. $x = 50^\circ, y = 40^\circ$

Answer:

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11. in the figure, X is a point in the interior of square $ABCD$. $AXYZ$ is also a square. If $DY = 3cm$ and $AZ = 2cm$. Then $BY =$

A. 5cm

B. 6cm

C. 7cm

D. 8cm

Answer: