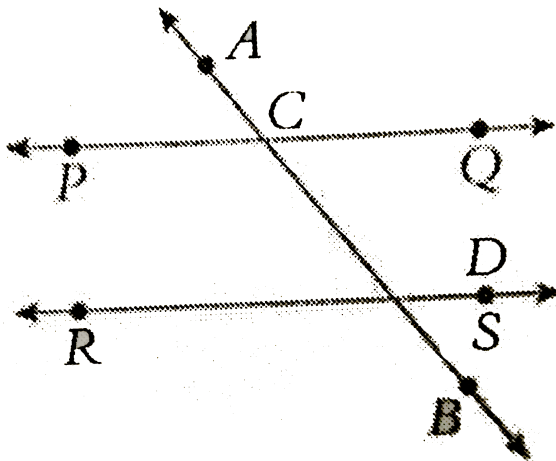# MATHS

BOOKS - PEARSON IIT JEE FOUNDATION

GEOMETRY

Example

1.

In the figure above, $\overline{PQ}$ and $\overline{RS}$ are parallel. $\overline{AC}$ is transversal of

$\overline{PQ}$ and $\overline{RS}$. If $\angle(ACP) = 5x - 70°$ and $\angle BDR = 4x + 70°$, then find the value of x.

2. The sides of a $\triangle ABC$ measure 7 cm, 24 cm and 25cm. What type of a triangle is ABC ?

3. In $\triangle PQR$, $\angle P = 50°$ and $\angle Q = 60°$. Find `angleR.

4. In $\triangle ABC$, $AB = 5cm$ and $BC = 4cm$. Find the range of value that CA can take.

5. In $\triangle ABC$, $AC = BC$ and $\angle BAC = 50°$. Find $\angle BCA$.

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6. The ratio of the product of the sides of an equilateral triangle to its perimeter is equal to the ratio of the product of the sides of another equilateral triangle to its perimeter. Then the triangles are
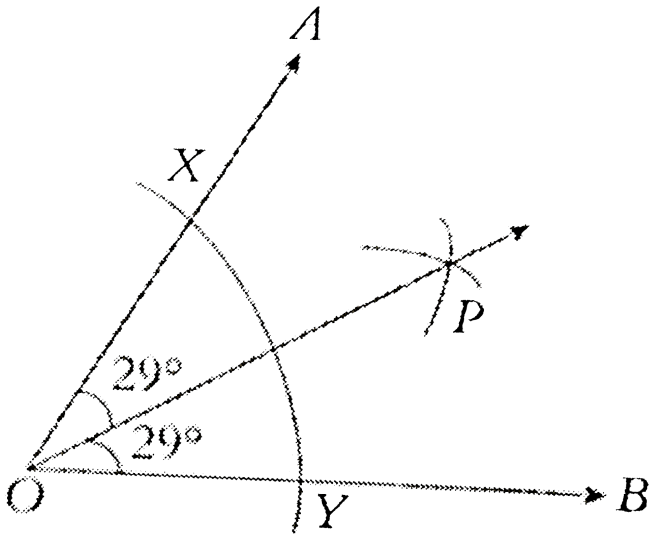
> ▶ **Watch Video Solution**

7.
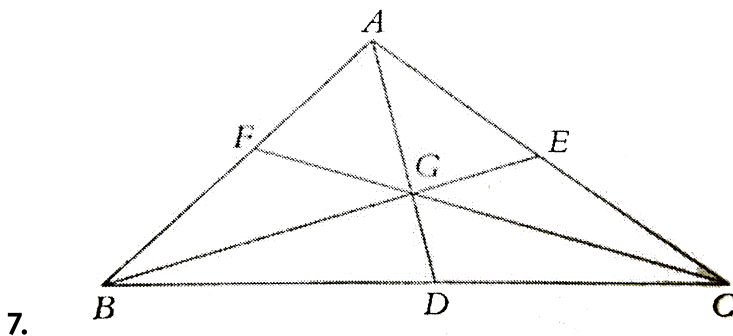
In the above $\triangle ABC$, $\overline{AD}, \overline{BE},$ and $\overline{CF}$ are the medians. G is the centroid. What is the ratio of the areas of $\triangle BGD$ and $\triangle GCE$?

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8. Draw the perpendicular bisector of the line segment AB= 6 cm .

9. Draw the bisector of $\angle AOB = 58°$

10. Construct a triangle ABC in which AB=2.2, BC=1.9 cm, and $\angle B = 54°$

11. Construct a triangle PQR in which PQ= 2cm. $\angle P = 45°$, and $\angle Q = 105°$.

12. Construct a circumcircle for the triangle ABC in which AB=3 cm, BC=3.5 cm , and AC=3.5 cm.
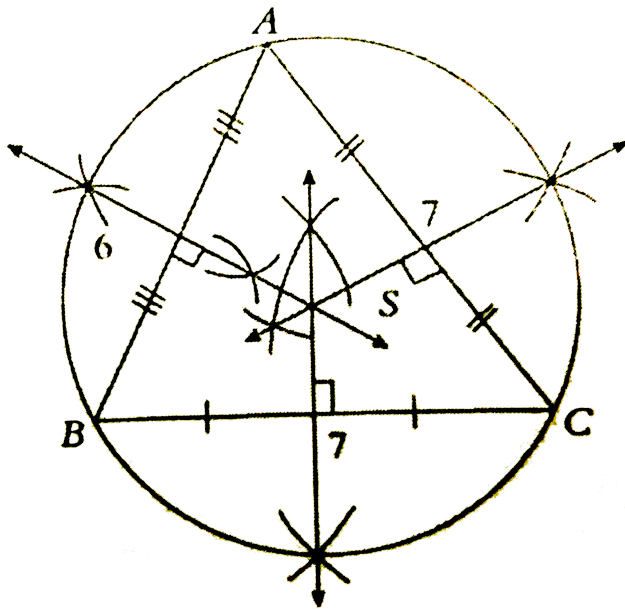
13. The following sentences are the steps involved in construction of the incircle for the triangle XYZ in which $\angle Y = 90°$, $XZ = 6$ cm and $YZ = 4$ cm.

Arrange them in sequential order from the first to the last.

(A) Mark the foot of the perpendicular from I onto YZ as D.

(B) Construct the triangle XYZ with $\angle Y = 90°$, $XZ = 6$ cm and

$YZ = 4cm.$

(C) Draw a circle with I as the centre and ID as radius. This is the required incircle.

(D) Draw the bisectors of $\angle X$, $\angle Y$ and $\angle Z$ and mark their point of concurrence as I.
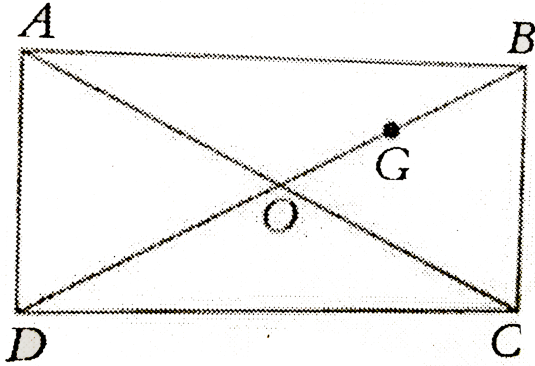
> ▶ **Watch Video Solution**

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14. Construct the excircle for the triangle ABC opposite to the vertex A in which AB=AC=5 cm and BC=4 cm.

> ▶ **View Text Solution**

15.

In the figure, $ABCD$ is a rectangle and G is the centroid of the triangle ABC. If $BG = 4cm$, then find the length of AC.

A. 12 cm

B. 13 cm

C. 14 cm

D. 15 cm

Answer: A

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16. ABCD is a kite in which AB=AD and CB=CD. If $\angle ABD = 25°$ and $\angle BDC = 35°$, then find $\angle A - \angle C$.

17. Construct a quadrilateral ABCD in which AB=4.2 cm , $\angle = 80°$, $BC = 2.4$ cm, CD=3.3 cm, and AD=2.4 cm.

18. Construct a quadrilateral ABCD with AB=4 cm , BC=2.8 cm, CD=4 cm, $\angle = 75°$, and $\angle C = 105°$

19. Construct a quadrilateral ABCD in which AB =4.6 cm , BC=2.6 cm, CD=3.5 cm, AD=2.6 cm , and the diagonal AC=4.9 cm.

3.5 cm

4.9 cm

2.6 cm

2.6 cm
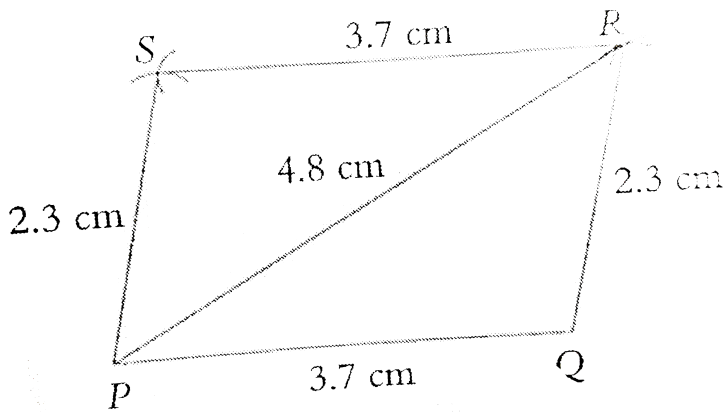
4.6 cm

D   C

A   B
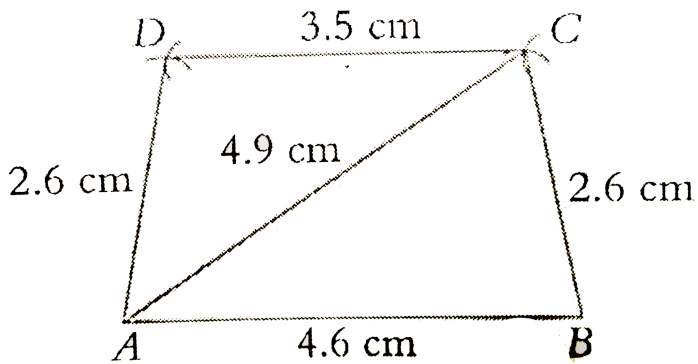
20. Construct a parallelogram ABCD, when AD=4 cm, BC=2.5 cm, and $\angle B = 100°$.

21. Construct a parallelogram PQRS, when $PQ = 3.7cm, QR = 2.3cm,$ and $PR = 4.8cm.$

22. Construct a parallelogram PQRS with PR=3 cm , QS=4.2 cm, and the angle between the diagonals are equal to $75°$,

23. Construct a rectangle PQRS with PQ=5.2 cm and QR=2.6 cm.

24. Construct a rectangle PQRS with PQ=5.3 cm and diagonal PR=5.8 cm.

25. Construct a rectangle PQRS such that PR=5.2 cm and the angle between the diagonals is $50°$.

26. Construct a square of side $3cm$.

27. Construct a square with its diagonal as 4 cm.

28. Construct a rhombus PQRS with PQ=3.6 cm and $\angle P = 50°$.

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29. Construct a rhombus PQRS such that PQ=3.2 cm and PR=4.2 cm.

> ▶ Watch Video Solution

30. Construct a rhombus PQRS with diagonal PR=3.4 cm and QS=3.6 cm.

> ▶ Watch Video Solution

31. The sum of the interior angles in a polygon is $1980°$. Find the number of sides of the polygon.

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32. Which of the following angle cannot be an interior angle of any convex polygon ?

A. 90

B. 270

C. 180

D. 145

Answer:

33. Which of the following has only 2 lines of symmetry?

A. Equilateral triangle

B. Rhombus

C. Circle

D. None of these

Answer: B

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34. Which of the following is point symmetric?

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1. The point of concurrence of medians of a triangle is called centroid.

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2. The point of concurrence of altitudes of a triangle is called orthocentre.

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3. Centroid of a triangle divides its median in the ratio of 1:2 from the vertex.

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4. The number of independent measurement required to construct a circle is two.

> ▶ Watch Video Solution

5. The number of independent measurement required to construct an isosceles trapezium is three.

> ▶ Watch Video Solution

6. Angle made by a longer chord of circle at its centre is $180°$.

> ▶ Watch Video Solution

7. The point of concurrence of perpendicular bisectros of the sides of a triangle is called _____

> ▶ Watch Video Solution

8. Incentre of a triangle is _____ from all its sides.

> ▶ Watch Video Solution

9. Each angle in an equlilateral triangle is _____

> ▶ Watch Video Solution

10. In an isosceles triangle, if one of its equal angles is $40°$, then the greatest angle is _____

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11. In a $\triangle ABC$, if the exterior angle of C is $135°$, then $\angle A + \angle B =$

_____

12. In a $\triangle ABC$, incentre, circumcentre, and orthocentre coincide each other, then $anglA + \angle B =$ _____

13. The point which is equidistant from all the points on the circumference of a circle is called _____

14. Circumference of a circle is _____ times to its radius.

15. Number of independent measurement required to construct a triangle is _____

   A. 3

   B. 2

   C. 4

   D. 6

Answer: A

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16. ABCD is a parallelogram . If $\angle A + \angle C = 120°$, then $\angle B + \angle D$ = _____

   A. $140°$

   B. $180°$

C. $220°$

D. $240°$

Answer: D

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17. If all the sides are equal , then the quadrilateral must be _____

A. rhombus

B. rectangle

C. triangle

D. none of these

Answer: A

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18. A line which intersects a circle at two distinct point is called a _____ of the circle.

19. The number of lines of symmetry of a square is _____

A. 2

B. 3

C. 4

D. Infinite

Answer: C

20. The number of lines of symmetry of a reactangle is _____

A. 2

B. 3

C. 4

D. 4

Answer: A

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21. The sum an angle and one-third of its supplementary angle is $90°$.

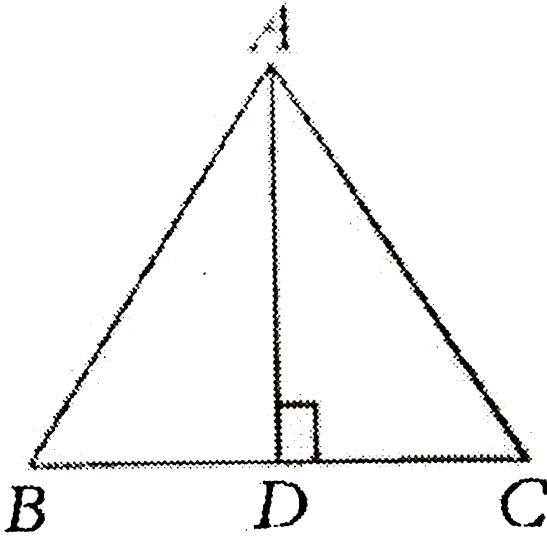Find the angle.

A. $135°$

B. $120°$

C. $60°$

D. $45°$

Answer: D

22. One pair of opposite angles of a parallelogram is $(2x - 50°, x + 20°)$. Then the parallelogram necessarily is _____

A. a rhombus

B. a square

C. a rectangle

D. a trapezium

Answer: C

23.

In the figure above, ABC is a triangle in which BC=10 cm and AC=13 cm. If AD is the perpendicular bisector of BC, then find the length of AD.

    A. 12

    B. 13

    C. 10

    D. 5

Answer: A

24. Which of the following is the set of measures of the sides of triangle ?

    A. 8cm, 4 cm, 20 cm

    B. 9cm, 17 cm, 25cm

    C. 11 cm, 16cm, 28 cm

    D. 6cm, 7cm, 12 cm

Answer: B

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25. In which of the following cases, a right triangle cannot be constructed ?
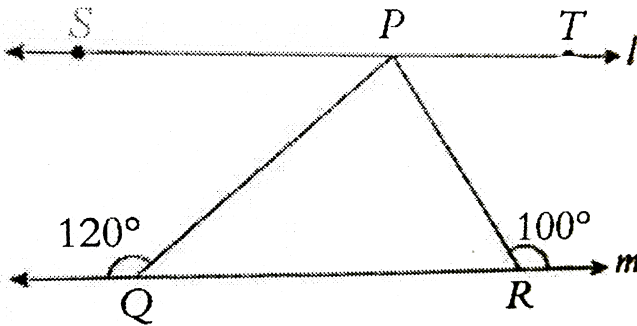
    A. 12 cm, 5cm, 13 cm

    B. 8 cm , 6 cm, 10 cm

C. 5 cm , 9 cm , 11 cm

D. 9 cm, 40 cm, 41 cm.

Answer: C

Short Answer Type Question

1.

In the figure above, if l//m, then find $\angle QPS + \angle RPT$.

2. If the supplementary angle of x is 4 times its complementary angle , then find x.

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3. Which of the following is not Pythagorean triplet(s)?
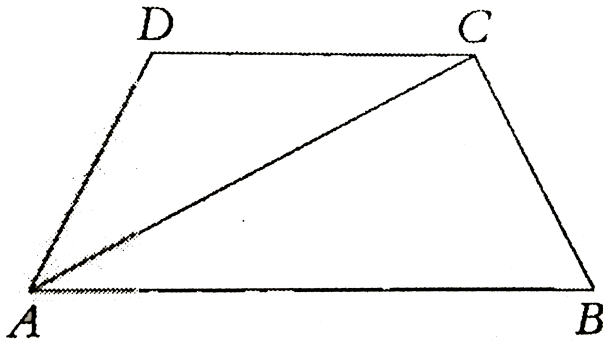
    A. 3,4,5

    B. 8,15,17

    C. 7,24,25

    D. 13,26,29
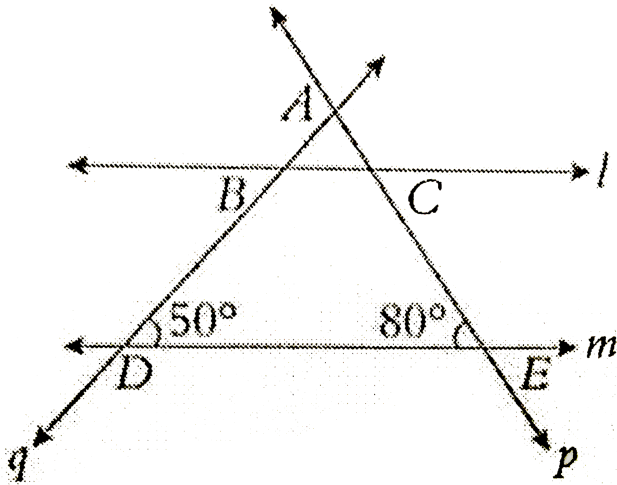
Answer: A::B::C::D

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4.

In the figure above (not to scale) , ABCD is a trapezium in which AB // DC. $\angle ACB = 70°$ and $\angle ACD = 30°$. Find $\angle ABC$.

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5. Two angles of a triangle are $72°$ and $38°$. Find the third angle.
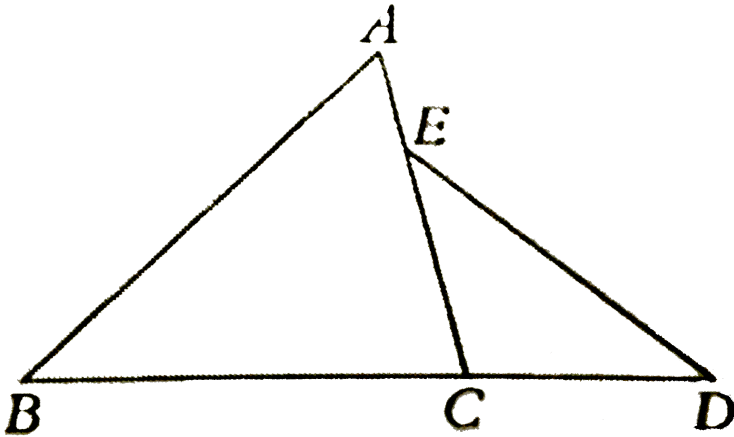
▶ **Watch Video Solution**

6.

In the figure above, if l//m, then what type of a triangle is ABC ?

7.

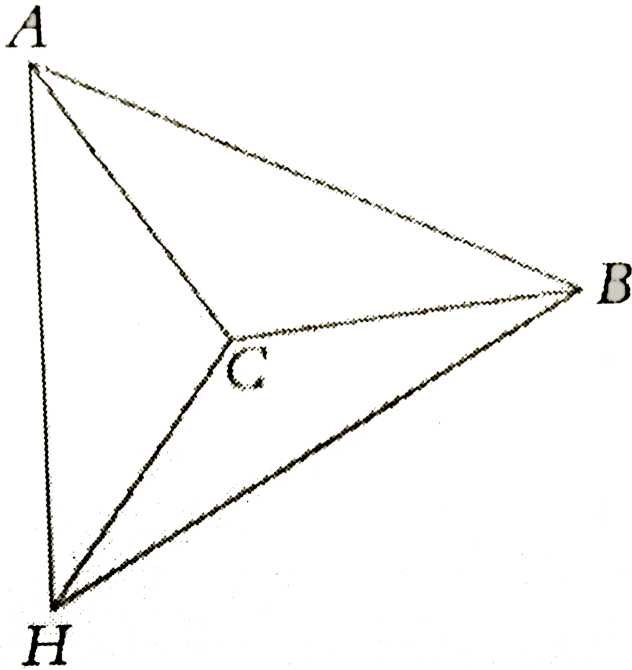In the figure above, BC=AC, CD=CE. If $\angle ABC = 50°$, then find $\angle CED$.

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8. In a $\triangle ABC$, $\angle B = 90°$ and $AC = 8\sqrt{2}$. If AB=BC, then find AB.
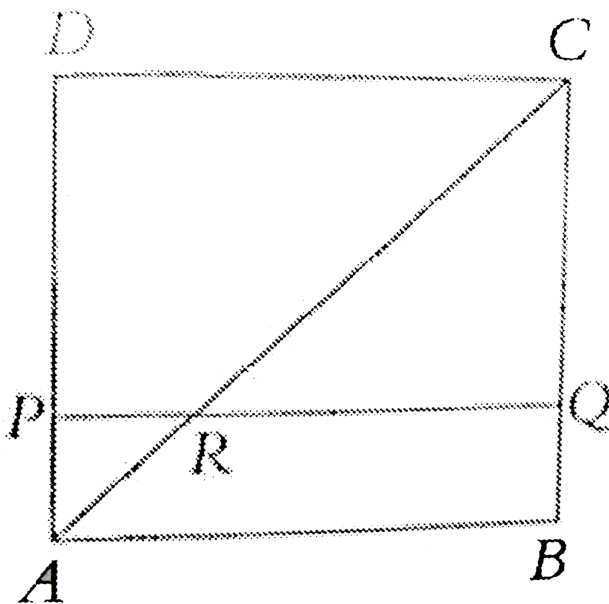
▶ Watch Video Solution

9.

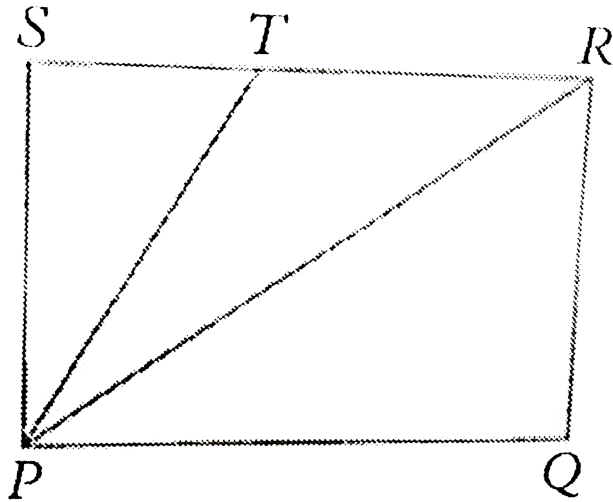In the figure above (not to scale), $\triangle ACB \cong \triangle ACH \cong \triangle BCH$. Find $\angle BCH$.

10.

In the figure above, ABCD is a square and PQCD is a rectangle. Find $\angle PRC$.

11.

In the figure above, PQRS is a square , $\angle PTR = 110°$, then find $\angle TPS$.

12.
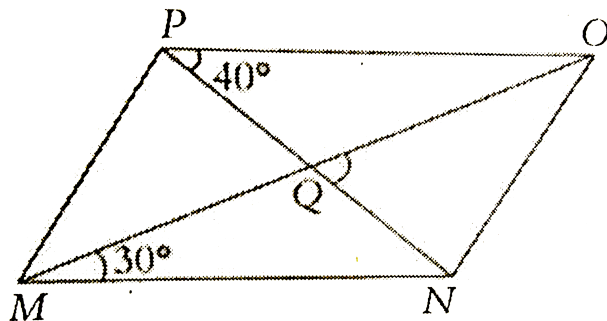
In the figure above, MNOP is a parallelogram, diagonals MO and PN intersect at Q, $\angle OPQ = 40°$ and $\angle OMN = 30°$. Find $\angle OQN$.

> ▶ Watch Video Solution

13. In a triangle ABC, AB=BC and $\angle A = 60°$. Find $\angle B$.

> ▶ Watch Video Solution

14. The angles of quadrilateral are $x - 5°$, x, $x + 5°$, and $x + 10°$. Find the smallest angle of the quadrilateral.

A. $90°$

B. $\left(82\frac{1}{2}\right)°$

C. $\left(82\frac{3}{4}\right)°$

D. $\left(79\frac{1}{4}\right)°$

Answer: B

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15. Draw all the possible lines of symmetry of the letter H.

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16. Draw all the possible lines of symmetry of an equilateral triangle.

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17.
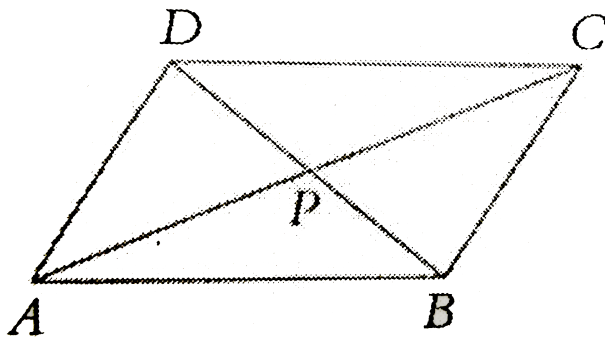
In the figure above, ABCD is a parallelogram , and if AC=30 cm and BD=20 cm, find CP+DP.

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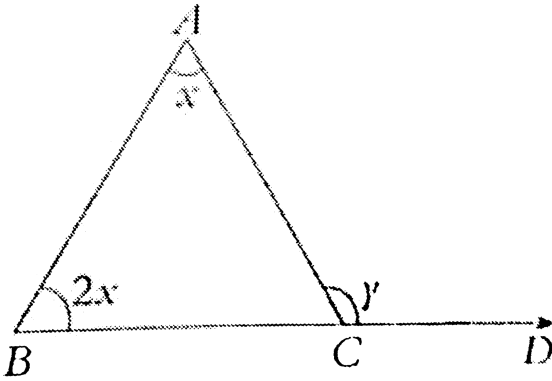**18.** In an n-sided regular polygon, each exterior angle is $72°$. Find the sum of all the interior angles of the polygon.

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19. In the figure given below, AB=AC and BC is extended to the point D. Find y-x
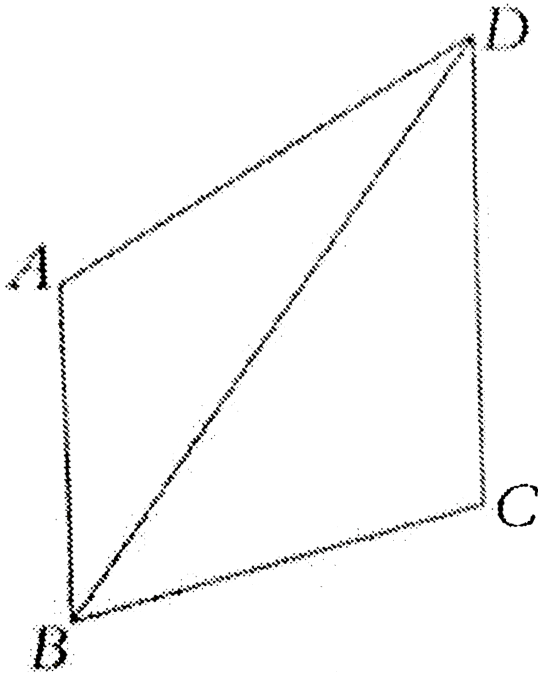
20.

In the above figure, AB=BC=8 cm and AD=CD=10 cm, which axiom best proves the congruence of $\triangle ABD$ and $\triangle CBD$?

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21.
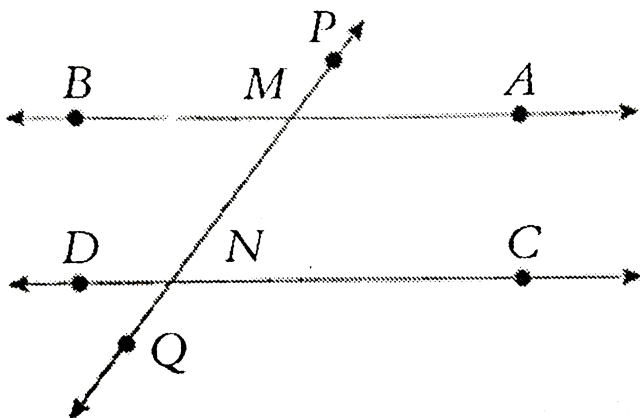
In the figure above, $\overline{BA}$ is parallel to $\overline{DC}$, and $\overline{PQ}$ is a transversal of $\overline{BA}$ and $\overline{DC}$. If $\angle PMA = 70°$ and $\angle DNM = 2x + 30°$, then find the value of x.

22.
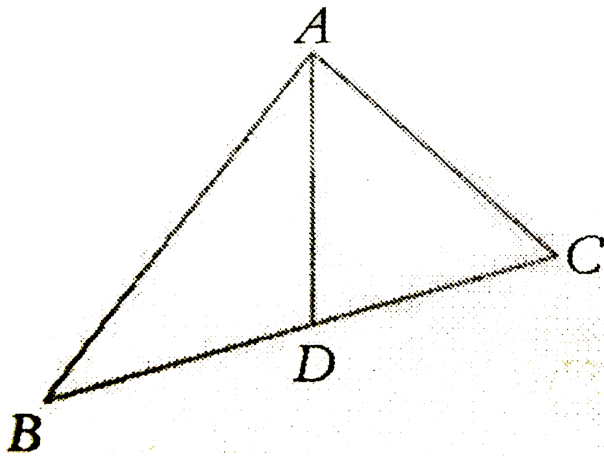
In the figure above ,AD=AC=BD. The point B, D and C are collinear. If $\angle CAD = 80°$, then find $\angle DAB$.
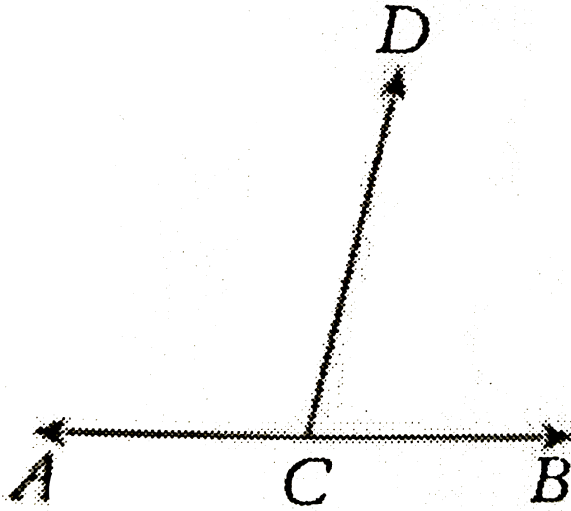
23.

In the above figure, ACB is a straight line and $\angle ACD : \angle DCB = 2 : 1$. Find $\angle DCB$.

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24. In an isosceles right triangle PQR, if $\angle Q = 90°$, then find $\angle PRQ$.

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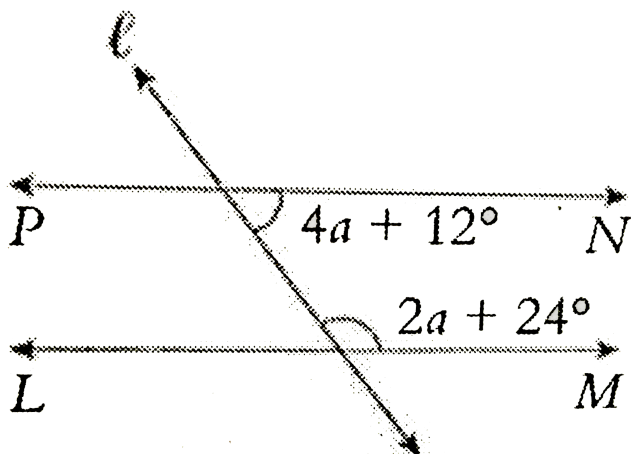
25.

In the given figure, $\overline{LM}//\overline{PN}$ and the line l is a transversal of $\overline{LM}$ and $\overline{PN}.$ Find the value of a .

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26. Find the sum of the interior angles of the an 8-sided polygon.

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27. ABCD is a rhombus, in which the length of the diagonals AC and BD are 6 cm and 8cm, respectively. Find the perimeter of the rhombus ABCD.

28. In a triangle ABC, if $\angle A = \angle B + \angle C$, the prove that triangle ABC is a

right triangle.
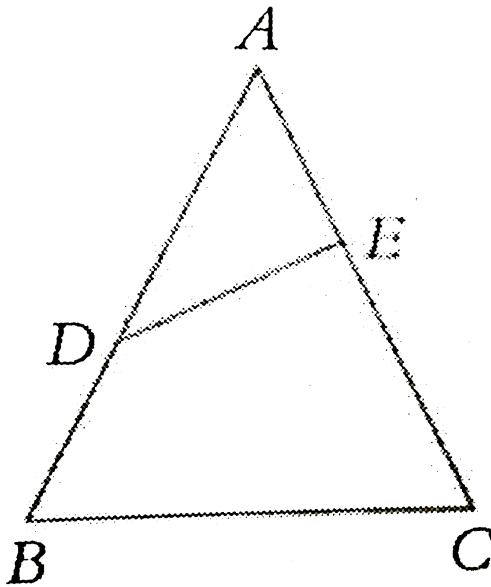
29.

Triangle ABC is an equilateral triangle. If $\angle ADE = 30°$, then find $\angle AED$

.

Easy Type Question

1.
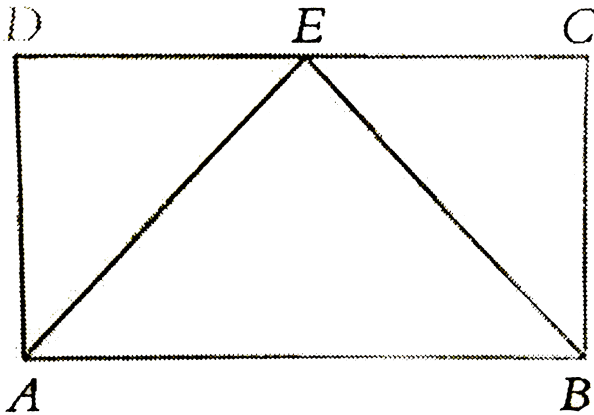
In the figure above (not to scale), ABCD is a rectangle, E is the mid - point of CD. If CD=24 cm and AD=5 cm, then find the perimeter of $\triangle ABE$.

2.
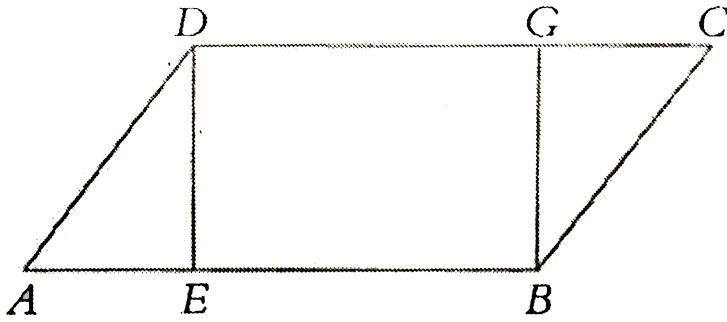
In the figure above, ABCD is a parallelogram, $\overline{BE} \perp \overline{AB}$, $\overline{BG} \perp \overline{CD}$, and EBGD is a square. If BG=12 cm and BC=13 cm , then find AB.

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3.
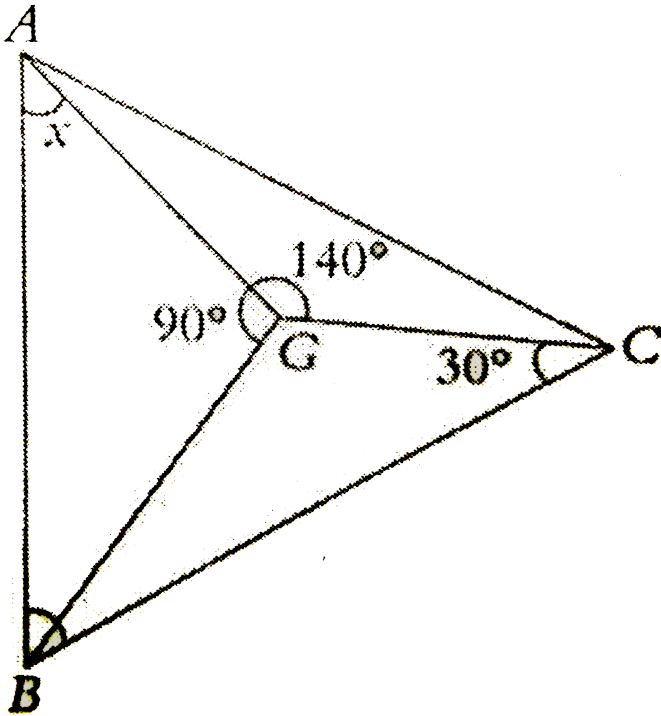
In the figure above, $\angle ABC = 60°$. Find x.

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4. In a triangle PQR, if $\angle Q$ is obtuse and S is the orthocentre of $\triangle PQR$, then find the orthocentre of $\triangle PSR$.

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5.
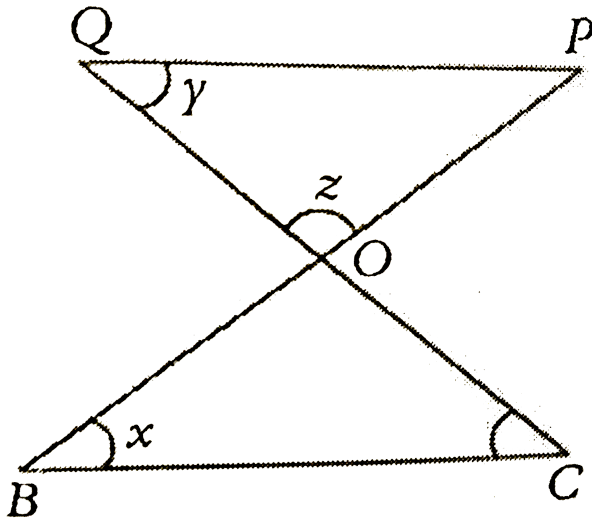
In the figure above, $\overline{BC} \mid \mid \overline{PQ}, \overline{BP}$ and $\overline{CQ}$ intersect at O. If $x + y = 80°$ and $z - y = 55°$, then find x and y.

6.
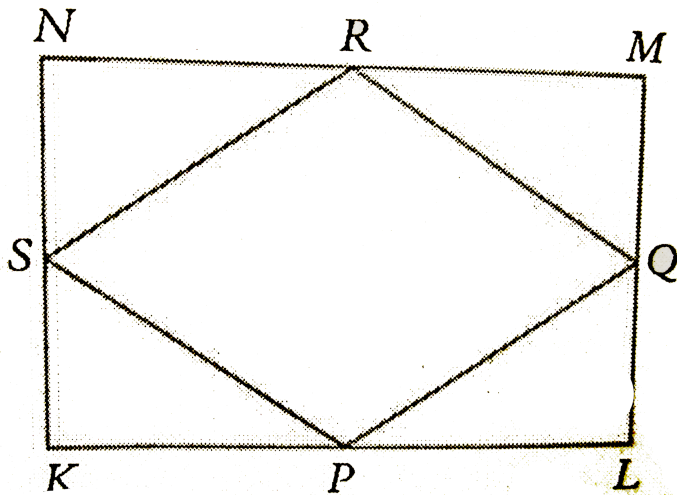
In the figure above, KLMN is a rectangle . P,Q,R and S are the mid-points of $\overline{KL}, \overline{LM}, \overline{MN},$ and $\overline{NK},$ respectively. If $\angle KPS = 30°,$ then find $\angle QRS.$

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7.
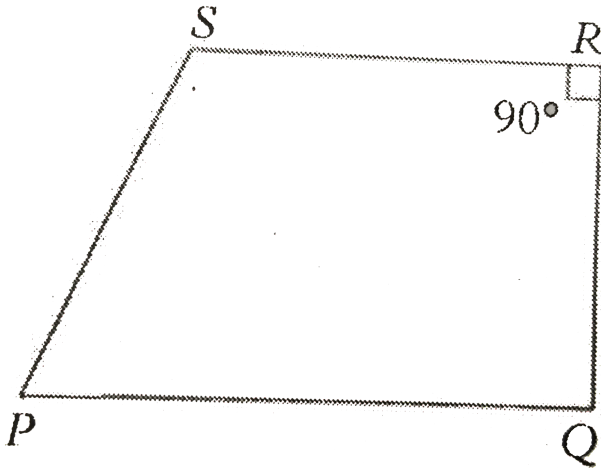
In the figure above, PQRS is a trapezium , PQ//SR, QR=RS, and $\angle QRS = 90°$. If QR=24 cm and PS=25 cm , then find the length of PQ.

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8. The sum of 3 distinct angles is equal to the sum of 2 right angles and the difference between two pairs of the angles is $10°$. Find the smallest among the angles.

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9. P is an interior point of square ABCD. Prove that

$$PA + PB + PC + PD > 2AB.$$

10. How can you draw a circle that passes through four vertices of a rectangle ? Explain.

11.
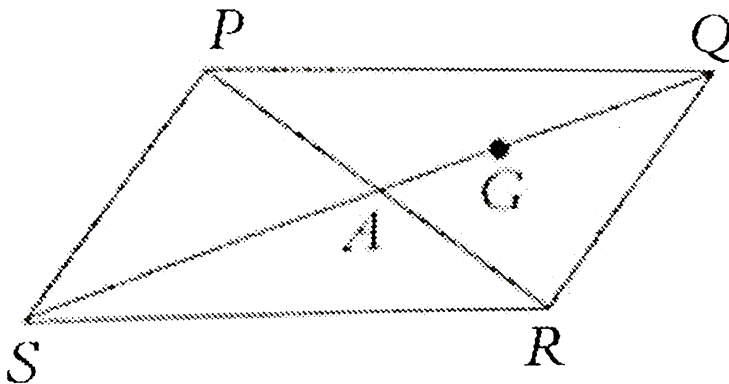
In the figure above, PQRS is a parallelogram and G is the centroid of the

triangle PQR . A is the point of intersection of the diagonals PR and SQ. If AG=3 cm, then find the length of SQ.

12.
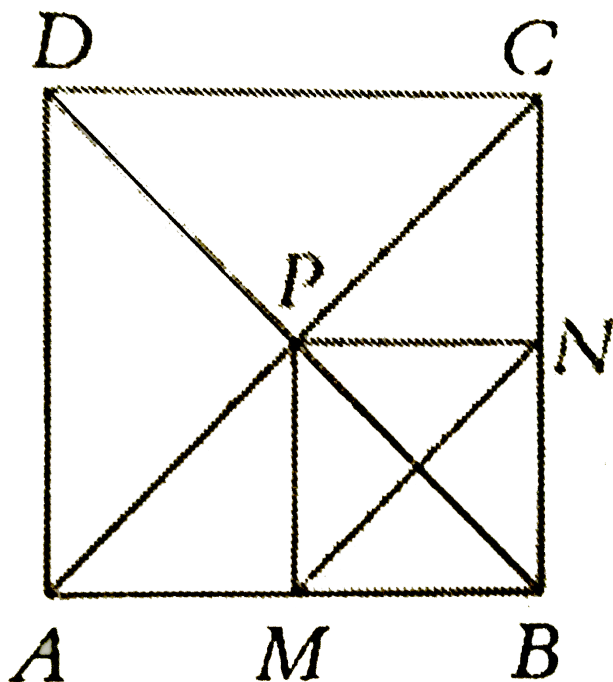
In the figure above, ABCD is a square of side 18 cm and $\overline{PN} \perp \overline{BC}$ and $\overline{PM} \perp \overline{AB}$. Find the length of MN.

13. ABCD is a kite in which AB=AD and CB=CD. If $\angle ABD = 30°$ and $\angle BDC = 40°$, then find $\angle A + \angle C$.

14. Find the complement of an angle whose supplement is $100°$.
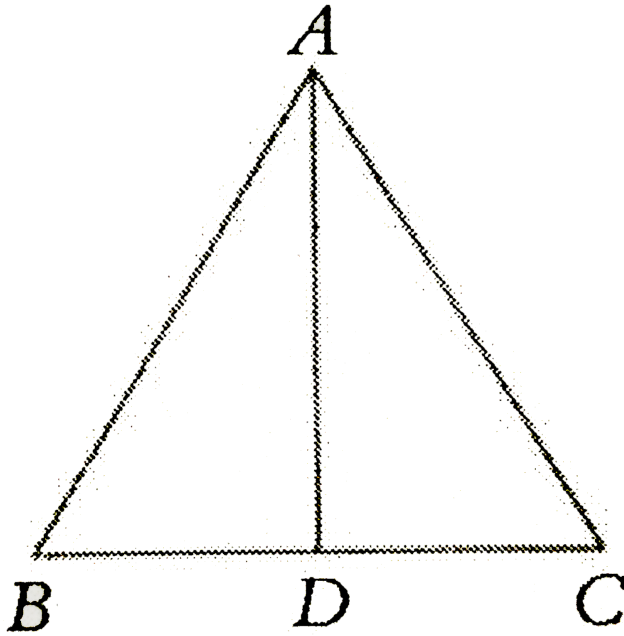
15.

In the given figure, AD is the bisector of $\angle BAC$. Prove that triangles ABD and ADC are congruent, if AB=AC.

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1. How many excircles can be drawn for a triangle ?

A. 3

B. 2

C. 4

D. 1

Answer: A

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2. In $\triangle ABC$, if $\angle A = 60°$, $\angle B = 50°$, and $\angle C = 70°$, then find the longest side of the triangle ABC.

A. BC

B. AB

C. AC

D. None of these

Answer: B

3. In a rhombus, if diagonals are equal, then the rhombus necessarily will

be ____

    A. a rectangle but not square

    B. a square

    C. a parallelogram but not a square

    D. Kite

Answer: B

4. What do you call the triangle whose two of its angles are $40°$ and $70°$

    A. Scalene

    B. Obtuse

C. Isosceles

D. Equilateral

Answer: C

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5. The measure of the side of a ΔPQR are integers in cm. If two of its sides are 1 cm each. Find the perimeter of the triangle.

A. 3cm

B. 4 cm

C. 5 cm

D. 6 cm

Answer: A

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6. If the angles of a linear pair are equal, then each angle is ____

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer: D

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7. ABCD is rhombus and $\angle BAD = 60°$. The measure of $\angle CAB$ is _____

A. $120°$

B. $60°$

C. $30°$

D. $80°$

Answer: C

8. Two complementary angles are in the ratio 2:3. Find the larger angle between them.

A. $60°$

B. $54°$

C. $66°$

D. $48°$

Answer: B

9. An angle is thrice its supplement. Find it.

A. 120°

B. 105°

C. 135°

D. 150°

Answer: C

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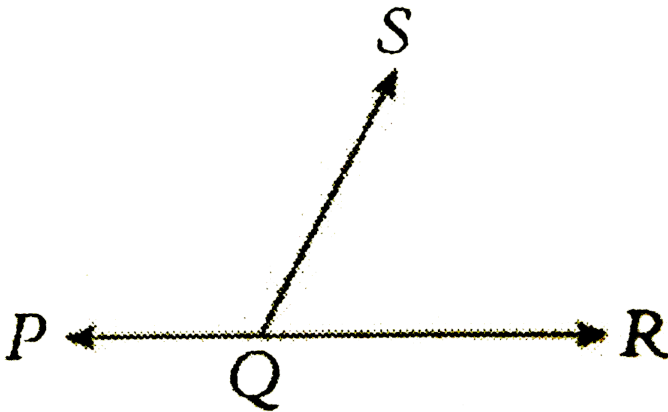
10.

In the above figure, PQR is a straight line and $\angle PQS : \angle SQR = 7 : 5$. Find $\angle SQR$.

11.
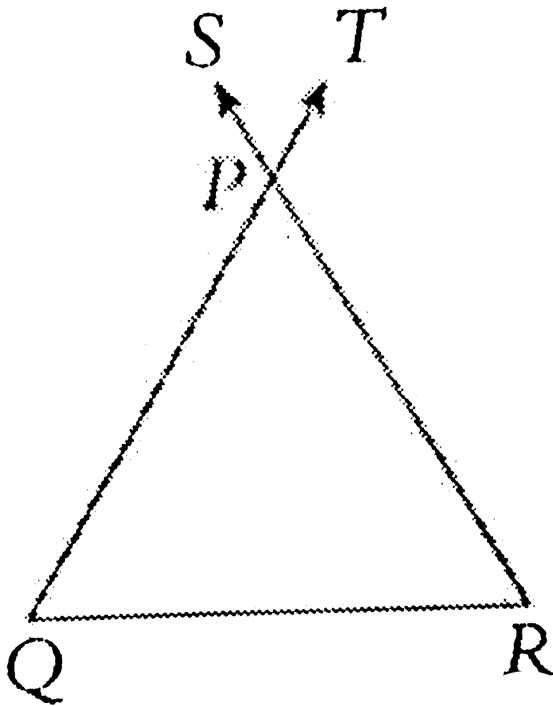
In the figure above, $\angle SPT = 60°$ and PQ=PR. Find $\angle PQR$

A. $50°$

B. $45°$

C. $60°$

D. 55°

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12.
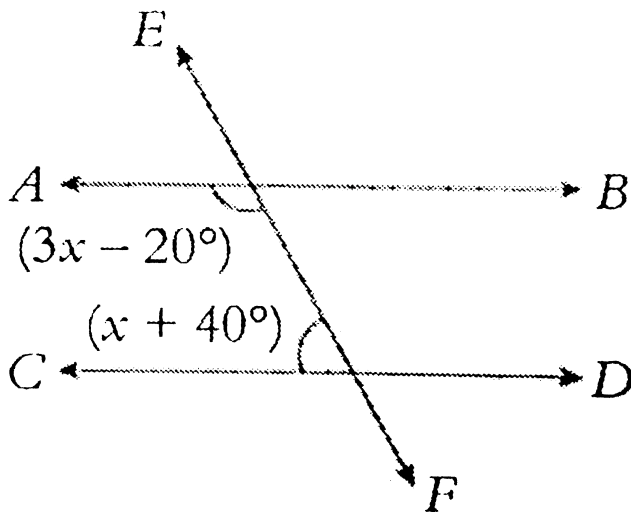
In the figure above, $\overline{AB}||\overline{CD}$. Find the value of x.

A. 50°

B. 45°

C. 60°

D. $40°$

Answer: D

> ▶ Watch Video Solution
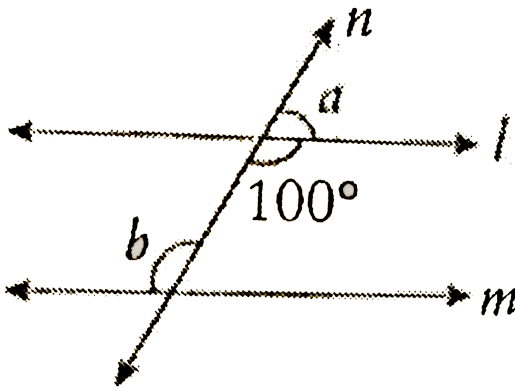
13.

In the figure above, l||m. Find the value of b-a.

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14. Which of the following is/are point symmetric ?

A. Rectangle

B. Square

C. Parallelogram

D. All of these

Answer: D

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15. Which of the following has an infinite number of lines of symmetry ?

A. Equilateral triangle

B. Isosceles triangle

C. Regular hexagon

D. Circle

Answer: D

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16. The sum of an angle and half of its complementary angle is $75°$. Find the angle .

    A. $40°$

    B. $50°$

    C. $60°$

    D. $80°$

Answer: C

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17. The adjacent angles of a rhombus are $2x - 35°$ and $x + 5°$. Find x.

    A. $70°$

    B. $40°$

    C. $35°$

D. $45°$

18.
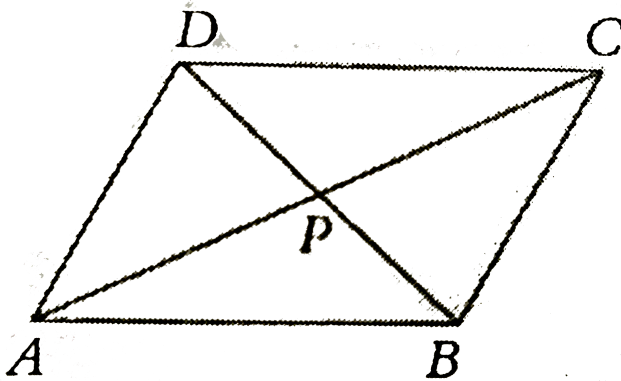
In the figure above, ABCD is a parallelogram, AC=14 cm and BD=10 cm, then AP+BP=_____ cm .

A. 5

B. 7

C. 24

D. 12

Answer: D

19. The following steps are involved in finding the largest angle of a quadrilateral PQRS, if $\angle P : \angle Q : \angle R : \angle S = 1 : 2 : 3 : 4$. Arrange them in sequential order.

(A) $10x = 360° \Rightarrow x = 36°$

(B) Let the angles be $\angle P = x, \angle Q = 2x, \angle R = 3x,$ and $\angle S = 4x$.

(C) The largest angle $= 4(36°) = 144°$

(D) Given $\angle P : Q : \angle R : S = 1 : 2 : 3 : 4$

(E) $\angle P + \angle Q + \angle R + \angle S = 360° \Rightarrow x + 2x + 3x + 4x = 360°$

A. DBAEC

B. DBACE

C. DBECA

D. DBEAC

Answer: D

20. The following steps are involved in finding the third side of an isosceles triangle whose two sides are 6 cm and 12 cm. Arrange them in seqential order.

(A) But the difference between two sides is less than the third side.

(B) Since the given triangle is isosceles, the possible measureof the third side is either 6 cm or 12 cm .

(C) ⟹ The measure of the third side is 12 cm.

(D) ∴ 6 cm cannot be the measure of the third side.

   A. BDAC

   B. BCAD

   C. BADC

   D. BACD

21. The following steps are involvedd in finding the angles of the triangles

ABC, when $\angle A : \angle B : \angle C = 1 : 2 : 3$. Arrange them in sequential order.

(A) Let the angle be $\angle A = x$, $\angle B = 2x$ and $\angle C = 3x$.

(B) Given $\angle A : \angle B : \angle C = 1 : 2 : 3$

(C) $\angle A = 30°$, $\angle B = 2(30°) = 60°$ and $\angle C = 3(30°) = 90°$.

(D) $\angle A + \angle B + \angle C = 180° \Rightarrow x + 2x + 3x = 180°$

(E) $6x = 180° \Rightarrow x = 30°$

    A. BADCE

    B. DBAEC

    C. BADEC

    D. BACDE

Answer: C

22. The following steps are involved in finding each of interior angle of 10-sided regular polygon. Arrange them in sequential order.

(A) Each exterior angle $= 36°$

(B) Each interior angle $= 180° - 36° = 144°$

(C) Each exterior angle $= \dfrac{360°}{n} = \dfrac{360°}{10}$ (given n=10)

    A. CAB

    B. BAC

    C. CBA

    D. BCA

Answer: A

Column A	Column B
23. The supplement of 60° is	(a) Square
24. If the diagonals of a rectangle are perpendicular, then the rectangle is called	(b) 30°
25. The longest side of a right triangle is called	(c) 120°
26. The compliment of 60° is	(d) Rhombus
	(e) Diagonal
	(f) Hypotenuse

23.

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24. Match the following Column A to Column B

Column A	Column B
27. The compliment of 45° is about a point	(a) Symmetrical
28. The letter B is	(b) 135°
29. The longest chord of a circle is called	(c) 45°
30. A parallelogram in which an angle is 90° is called a	(d) Symmetrical about a line
	(e) Diameter
	(f) Rectangle
	(g) Square

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Level 2

1. In a right triangle ,one of the acute angles is four times the other. Find its measure.

A. $68°$

B. $84°$

C. $80°$

D. $72°$

Answer: D

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2. In an isosceles triangle ABC, AB=AC and $\angle A = 3\angle B$. Find $\angle C$.

A. $36°$

B. $32°$

C. $28°$

D. $40°$

Answer: A

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3. The lengths of two sides of an isosceles triangle are 5 cm and 12 cm. The length of the third side is _____

    A. 12cm

    B. 5 cm

    C. 17cm

    D. 10cm

Answer: A

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4. In a triangle, which is not equilateral, the sides (in cm) are integers. The longest side is 3 cm. The perimeter of the triangle is _____

    A. 5 cm

    B. 6cm

C. 8 cm

D. 7 cm

Answer: D

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5. $\triangle ABC$ and $\triangle PQR$ are congruent if _____

    A. AB=BC=AC and PQ=QR=PR

    B. $\angle A = \angle P, \angle B = \angle Q$ and $\angle C = \angle R$

    C. $AB = PQ, BC = QR$ and $\angle B = \angle Q$

    D. $AB = PR, BC = RT$ and $\angle C = \angle T$

Answer: C

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6. In $\triangle PQR$ and $\triangle ABC$, $\angle Q = \angle B = 90°$, $PQ = AB$, and $QR = BC$. Which of the following property can be used to prove the congruence of $\triangle PQR$ and $\triangle ABC$?

   A. SSS

   B. RHS

   C. ASA

   D. SAS

Answer: D

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7. In a triangle TOP, its orthocentre lies at O. Then , the circumradius of $\triangle TOP$ is _____

   A. TO/2

   B. OP/2

C. TP/2

D. TO/4

Answer: C

8. If in a triangle, the circumcentre does not lie on its longest side , then it must be an/a____ triangle .

A. acute angled

B. right angled

C. obtuse angled

D. Either (a) or (c)

Answer: D

9. Which of the following must be a square ?

    A. A rhombus whose adjacent angler are equal.

    B. A rectangle whose adjacent sides are equal .

    C. Both (a) and (b)

    D. Neither (a) or (b)

Answer: C

10. A parallelogram in which the digonals bisect each other at right angles must be _____

    A. a rhombus

    B. a rectangle

    C. a square

    D. Either (b) or (c)

Answer: A

11. A triangle in which the sum of the squares of two side equals the square of the third side must be a/an ____ triangle.

A. right angled

B. aute angled

C. obtuse angled

D. None of these

Answer: A

12. Which of the following holds true ?

A. The geometric centre of a triangle equidistant from its sides is

called in centre or excentre.

B. The centroid divides each median in the ratio 2:1 from the vertex.

C. Both (a) and (b)

D. Neither (a) or (b)

Answer: C

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13. Which of the following can be one of the angles of a regular polygon ?

A. $150°$

B. $135°$

C. $120°$

D. All of these

Answer: D

14. A regular polygon has N sides where $N < 10$. Each of its interior angles is an integer in degrees. How many such polygons are possible ?

A. 7

B. 6

C. 8

D. 5

Answer: B

15. The sum of the interior angle of a 10-sided polygon is _____

A. $1260°$

B. $1440°$

C. $1800°$

D. $1620°$

Answer: B

16. In a regular convex polygon, each interior angle in not more than each exterior angle is not more than each exterior angle. How many such polygons are possible ?

A. 2

B. 3

C. 4

D. 1

Answer: A

17. ABCD is an isosceles trapezium . $\overline{AB}||\overline{CD}$. AE and BF are the perpendicular drawn to CD. The congruence property used to prove the congurence of triangles AED and BFC is _____
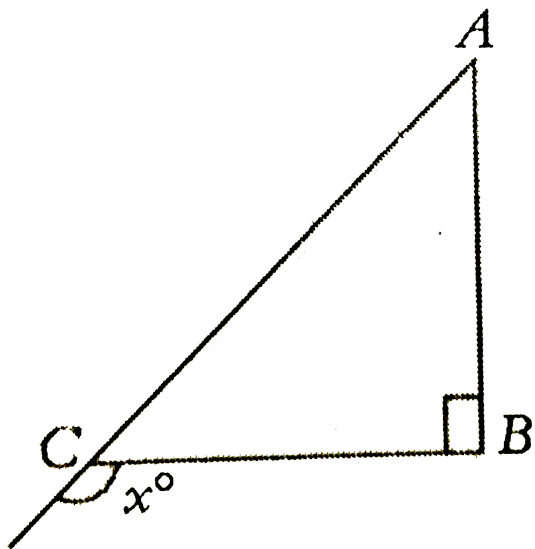
A. RHS

B. SAS

C. SSS

D. ASA

Answer: A

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18.

In the figure above, ABC is a right triangle and BC=AB , then find $x°$.

A. $45°$

B. $90°$

C. $120°$

D. $135°$

Answer: D

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19. Which of the following is not the set of measures of the sides of a triangle ?

    A. 7cm, 3 cm, and 5 cm

    B. 8 cm , 12 cm and 18 cm

    C. 5 cm , 6 cm , and 14 cm

    D. 5 cm , 12 cm, and 13 cm

Answer: C

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20. In which of the following cases can a right triangle ABC be constructed ?

    A. AB=5cm , BC=7cm, and AC=10 cm

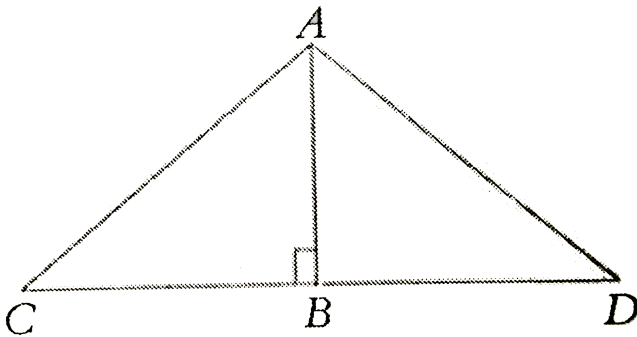   B. AB=7cm and BC=8cm and AC=12 cm

    C. AB=8 cm, BC=17 cm , and AC=15 cm

D. AB=9 cm, BC=9 cm ad AC=10 cm .

Answer: C

21.

In the figure above ,AB is the perpendicular bisector of CD. Which of the following axioms best proves the congurence of $\triangle ABC$ and $\triangle ABD$?
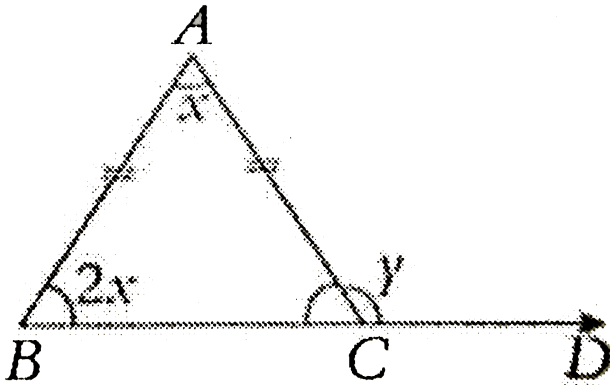
A. SSS

B. SAS

C. RHS

D. ASA

Answer: B

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22. In the figure above, if AB=AC and BC is extended to D, then find the value of x+y.

A. $120°$

B. $160°$

C. $40°$

D. $144°$

Answer: D

23. In a parallelogram, if the diagonals are equal, then the parallelogram necessarily will be

    A. a rhombus

    B. a rectangle
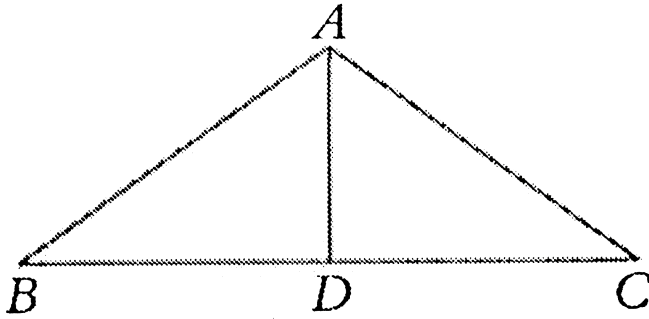
    C. a square

    D. a trapezium

Answer: B

24.

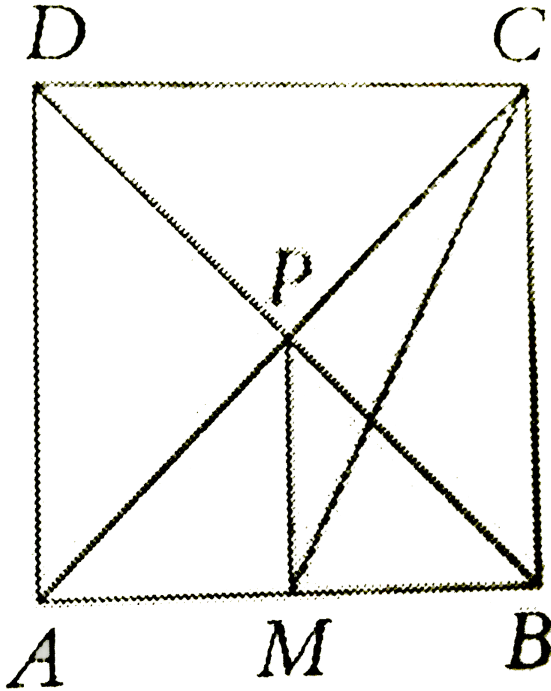In the figure above, ABC is a triangle in which BC=24 cm and AC=13 cm. If AD is the perpendicular bisector of BC, then find the length of AD.

A. 7 cm

B. 12 cm

C. 13 cm

D. 5 cm

Answer: D

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25.

In the figure above, ABCD is a square of side 8 cm and $\overline{PM} \perp \overline{AB}$. Find the length of MC.

A. $5\sqrt{5}\,cm$

B. $6\sqrt{5}\,cm$

C. $4\sqrt{5}\,cm$

D. $7\sqrt{5}\,cm$

Answer: C

26. In an n-sided regular polygon, each interior angle is $144°$. Find the number of the sides of the polygon.

A. 7

B. 8

C. 9

D. 10

Answer: D

Level 3

1. There are three angles. The second angle is one-third of the compliment of the first angle. The third angle is half of the supplement of the first angle. The third angle is 6 times the second angle. Find the first angle.
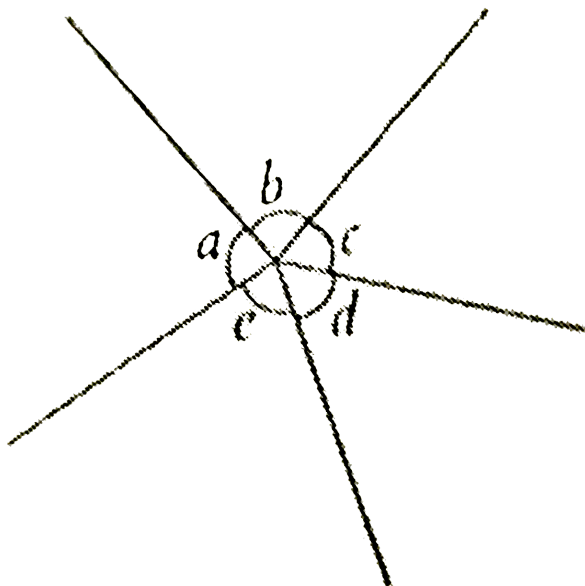
A. $45°$

B. $60°$

C. $75°$

D. $90°$

Answer: B

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2.

In the figure above, the angles a,b,c,d and e are consecutive integers in degrees, a=_____

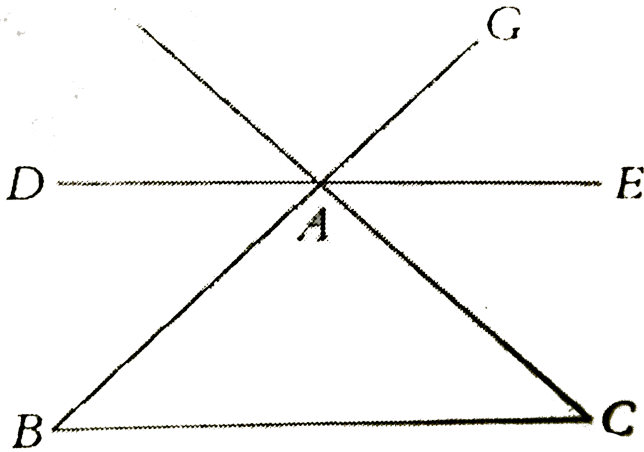   A. $70°$

   B. $74°$

   C. Either (a) or (b)

   D. Neither (a) nor (b)

Answer: C

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3.

In the figure above (not to scale),

DAE‖BC, $\angle BAD = (2x - 20)°$. Find $\angle EAC$.

   A. $40°$

   B. $25°$

   C. $30°$

   D. $35°$

Answer: C

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4. In a quadrilateral ABCD, $\angle A : \angle B : \angle C : \angle D = 3 : 4 : 5 : 6$. Then ABCD is a

_____

    A. trapezium

    B. parallelogram

    C. rhombus

    D. kite

Answer: A

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5. PQR and XYZ are triangles. The perimeter of each triangle is 12 cm. PQR

is an equilateral XY=4 cm and YZ=ZX. Both the triangles are _____

    A. congruent

    B. similar but not congruent

C. similar

D. Both (a) and (c)

Answer: D

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6. In a $\triangle ABC$, $\angle A = \angle B + \angle C$. O and S are the orthocentre and the circumcentre of $\triangle ABC$. If AB=12 cm and AC=5 cm, then find the distance between O and S.

A. 5.5 cm

B. 5 cm

C. 6.5 cm

D. 6 cm

Answer: C

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7. ABC and DEF are triangles. Consider the following :

I. $\angle A = 40°$, $\angle B = 60°$, $\angle C = 80°$, $AB = 5cm$, and $BC = 6cm$

II. $\angle D = \angle F$, $\angle E = 80°$, $DF = 6cm$, and $EF = 8cm$

Which of the following can be concluded ?

A. (I) is not possible.

B. (II) is not possible.

C. Both (I) and (II) are possible.

D. Both (I) and (II) are not possible.

Answer: D

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8. A is an obtuse angle. The measure of $\angle A$ and twice its supplement differ by $30°$. Then $\angle A$ can be
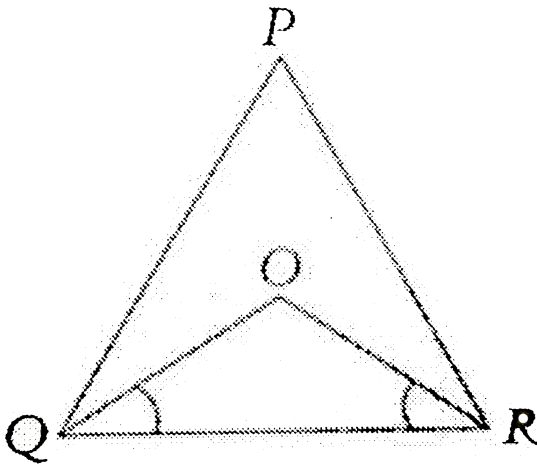
A. $150°$

B. $110°$

C. $140°$

D. $120°$

Answer: B

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9. In the figure below, $2\angle P = \angle QOR$. OQ and OR are bisectors of $\angle Q$ and $\angle R$ respectively. Find $\angle P$.

A. $60°$

B. $70°$

C. $40°$

D. $80°$

Answer: A

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10. ABCD is rhombus is which $\angle B = 120°$ and BD=5 cm. Find the perimeter of the rhombus ABCD.
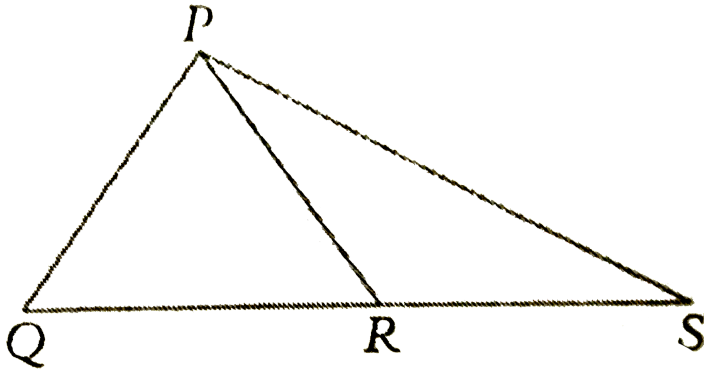
A. 16 cm

B. 20 cm

C. 24 cm

D. 30 cm

Answer: B

11.

In the figure above, $\angle Q = 2\angle S$ and $\angle QRS = 2\angle RPS$. Find $\angle RPS + \angle S$

A. $60°$

B. $45°$

C. $72°$

D. $54°$

Answer: A

12. The angles of a quadrilateral are in the ratio 3:4:5:6. Which of the following can be conclude ?

A. Exactly two angles are acute.

B. Two pairs of angles are supplementary.

C. Either (a) or (b)

D. Neither (a) nor (b)

Answer: C

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13. PQRS is a parallelogram in which PR is perpendicular to QS. If PR=8cm and QS=6 cm, then find PS

A. 5cm

B. 4cm

C. 7cm

D. 6cm

Answer: A

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14. An equilateral triangles ahs a circumradius of $4\sqrt{3}$ cm. Find its radius (
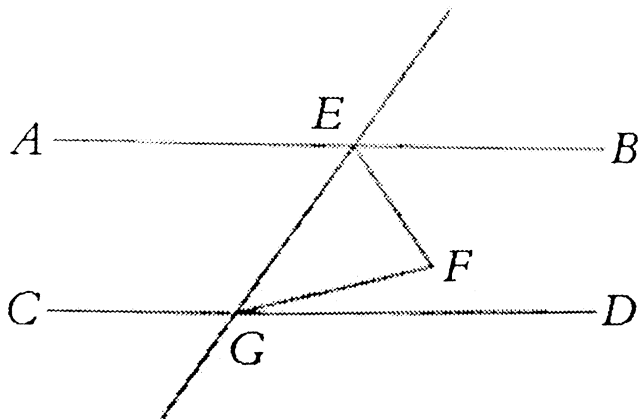
in cm).

A. $2\sqrt{3}$

B. $3\sqrt{3}$

C. $\sqrt{3}$

D. $\dfrac{\sqrt{3}}{2}$

Answer: A

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15.

In the figure above, AB || CD. EF and FG are the bisectors of $\angle BEG$ and $\angle DGE$, respectively. $\angle FEG = \angle FGE + 10°$. Find $\angle FGE$.

A. $20°$

B. $25°$

C. $40°$

D. $35°$

Answer: C

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16.

In the figure above, $\angle QPS = 2\angle SPR$, $\angle Q = \angle R + 40°$, and $\angle PSR = 120°$. Find $\angle QPR$.
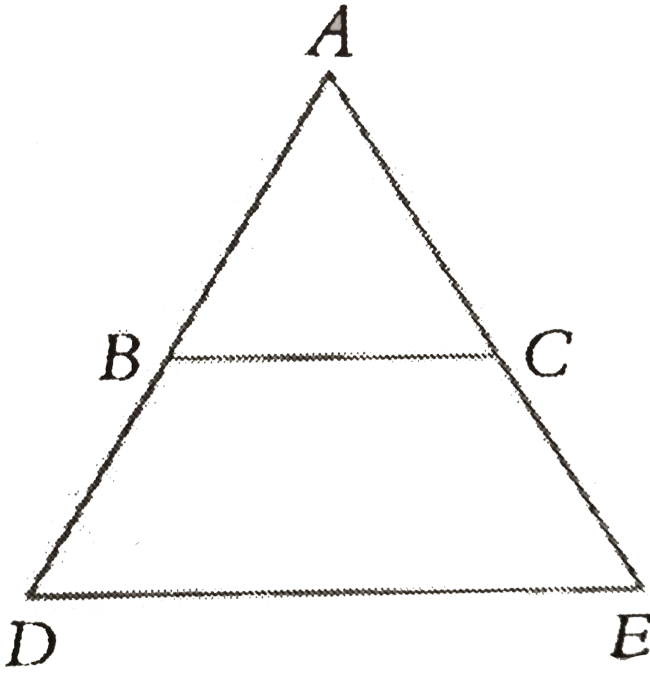
   A. $50°$

   B. $55°$

   C. $65°$

   D. $60°$

Answer: D

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17.

In the figure above, BC || DE and $\angle ABC = \angle CED$. $\angle A = \angle ACB - 30°$. Find $\angle A$.

A. $40°$

B. $50°$

C. $45°$

D. $55°$

Answer: A

18. In a rhombus, ABCD, half of angle A exceeds one-sixth of an angle B by $50°$. Find the larger of these angles.
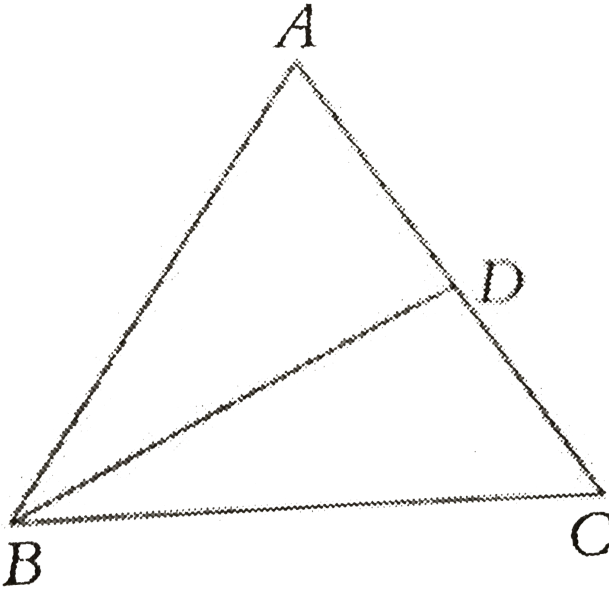
A. $120°$

B. $100°$

C. $110°$

D. $130°$

Answer: A

19.

In the figure above, BD is the altitude drawn to AC. Triangles ABD and CBD are congruent if _____

A. $AB = BC$

B. AD=CD

C. Either (a) or (b)

D. None of these

Answer: C

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1. If the measure of the angles of a triangles is in the ratio of 2:3:4. Find the measure of the angles.

The following steps are involved in solving the above problem. Arrange them in sequential order .

(A) $2x° + 3x° + 4x° = 180°$

(B) Let the angles be $2x°$, $3x°$ and $4x°$.

(C) $x° = 20° \Rightarrow 2x° = 40°, 3x° = 60°,$ and $4x° = 80°$

   A. BCA

   B. BAC

   C. ABC

   D. CBA

Answer: B

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2. The measure of one of the parallelogram is $70°$. Find the measures of the angles of the parallelogram .

The following steps are involved in solving the above problem. Arrange them in sequential order.

(A) $70° + x = 180° \Rightarrow x = 110°$

(B) Let the angle adjacent to $70°$ be x.

(C) The sum of the measures of adjacent angle of a parallelogram is $180°$.

(D) The measure of the angles of the parallelogram are $70°, 110°, 70°$ and $110°$

   A. CBDA

   B. BCAD

   C. BCDA

   D. CDAB

Answer: B

3. The sum of the measure of the interior angles of a polygon is $540°$.

Find the number of sides of the polygon.

    A. 8

    B. 7

    C. 6

    D. 5

Answer: D

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4. In a quadrilateral ABCD, $\overline{AC} \perp \overline{BD}$ and AB=AD. ABCD is a _____

    A. trapezium

    B. rhombus
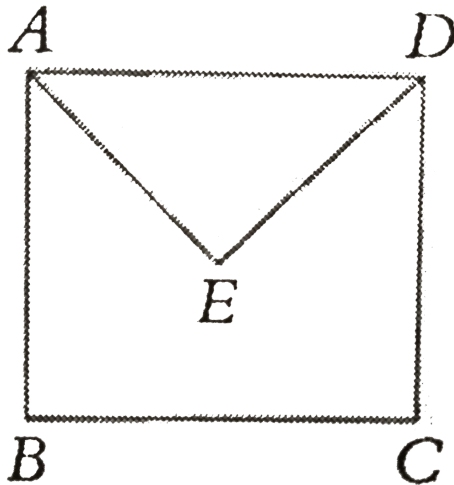
C. rectangle

D. Kite

Answer: D

5.

In the figure above, $\overline{AB} \mid\mid \overline{CD}$, $\angle BAE = 30°$ and $\angle CDE = 35°$. If $\overline{AB} \perp \overline{BC}$, then find $\angle AED$.

A. $60°$

B. $55°$

C. $65°$

D. $85°$

Answer: C

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6. The measure of one of the exterior angles of a triangle is $100°$. Which of the following is definitely the measure of one of the interior of that triangle?
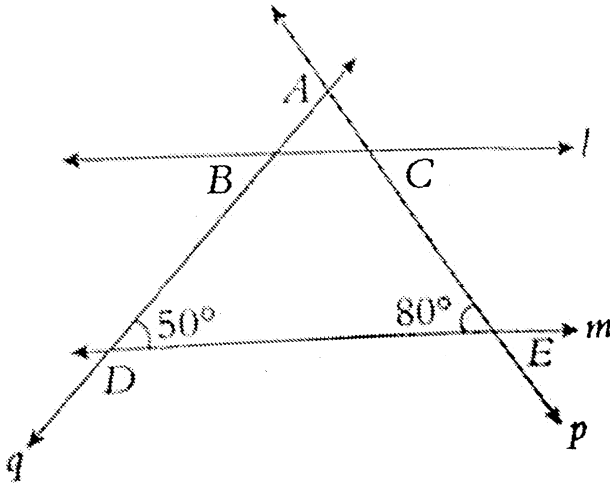
A. $50°$

B. $60°$

C. $70°$

D. $80°$

Answer: D
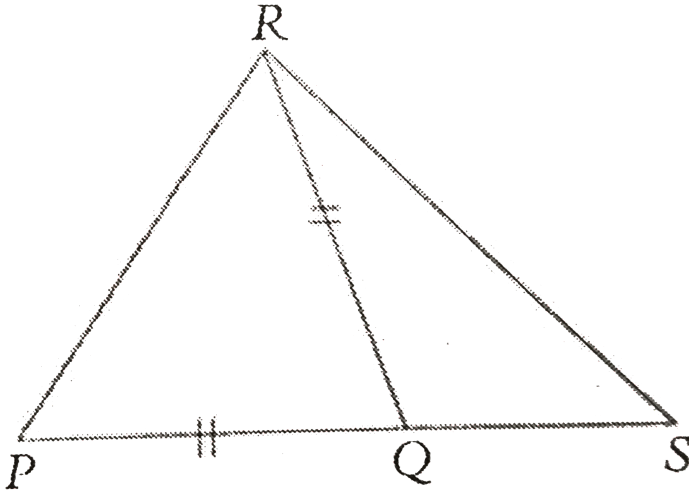
7. In the given figure, if l//m , then what type of a triangle is ABC ?

A. Equilateral

B. Isosceles

C. Scalene

D. Right angled.

Answer: B

8.

In the figure, PQ=QR, $\angle RPQ = 60°$, and $\angle QRS = 20°$. Find the measure of $\angle QSR$.

A. $20°$
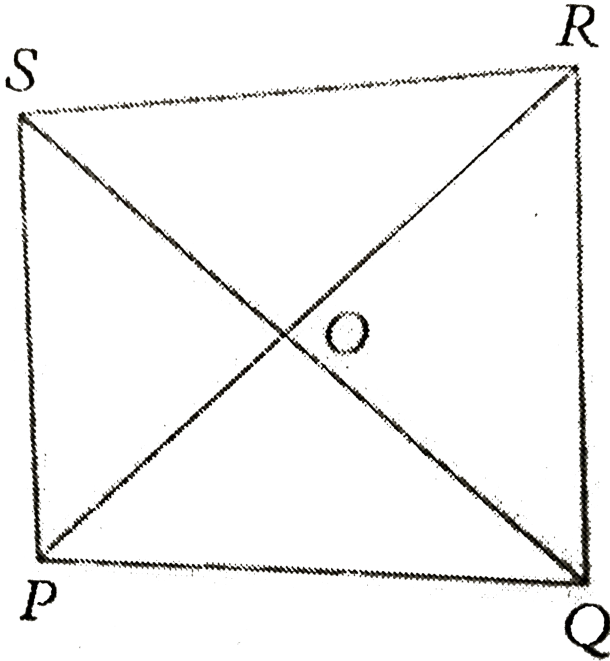
B. $30°$

C. $40°$

D. $50°$

Answer: C

9.

In the given figure, PQRS is a quadrilateral ,PR and QS intersect at O. If

$\angle PQR = 70°, \angle SPQ = 80°,$ and $\angle PRQ = 60°,$ then find $\angle SPR.$

A. $30°$

B. $50°$

C. $40°$

D. $45°$

Answer: A

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10. One angle of a parallelogram is $30°$ more than twice its adjacent angles. Find the measure of its adjacent angle.

A. $50°$

B. $60°$

C. $70°$

D. $80°$

Answer: A

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11. Which of the following statement is definitely true ?

A. In a rhombus, the diagonals are equal.

B. In an isosceles trapezium, the diagonals bisect each other.

C. In a kite, the diagonals are perpendicular to each other.

D. In a trapezium on pair of opposite sides are parallel to each other.

Answer: C

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12. Match the following Column A to Column B

Column A	Column B
12. The point of concurrence of altitudes of a triangle is the	(a) Circumcentre
13. The point of concurrence of medians of a triangle is the	(b) Centroid
14. The point of concurrence of the bisectors of the angles of a triangle is the	(c) Incentre
15. The point of concurrence of the perpendicular bisectors of the sides of a triangle is the	(d) Orthocentre

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Test 2

1. The measures of the angle of a triangle are in the ratio of 1:2:3. find the angles of the triangle.

The following steps are involved in solving the above problem. Arrange them in sequential order.

(A) The angles of the triangle are $30°$, $60°$, and $90°$.

(B) $x = 30°$ ltbgt (C) Let the angles of the triangles be $x°$, $2x°$, and $3x°$.

(D) $x° + 2x° + 3x° = 180°$

   A. CBDA

   B. CDBA

   C. CDAB

   D. CBAD

Answer: B

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2. The measure of the angle of a quadrilateral are $40°, 80°$ and $100°$. Find the measure of the fourth angle.

The following steps are involved in solving the above problem. Arrange them in sequential order.

(A) $x° = 360° - 220°$

(B) Let the measure of the fourth angle be $x°$.

(C) $\therefore$ The fourth angle, x is $140°$.

(D) $40° + 80° + 100° + x° = 360°$

    A. ABDC

    B. ABCD

    C. BADC

    D. BDAC

Answer: D

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3. Find the number of sides of a regular polygon, if the measure of each of its interior angles is $150°$.

A. 12

B. 10

C. 8

D. 6

Answer: A

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4. In a quadrilateral PQRS, $\overline{PQ} \mid \mid \overline{RS}$ and PR=QS. PQRS is a /an_____
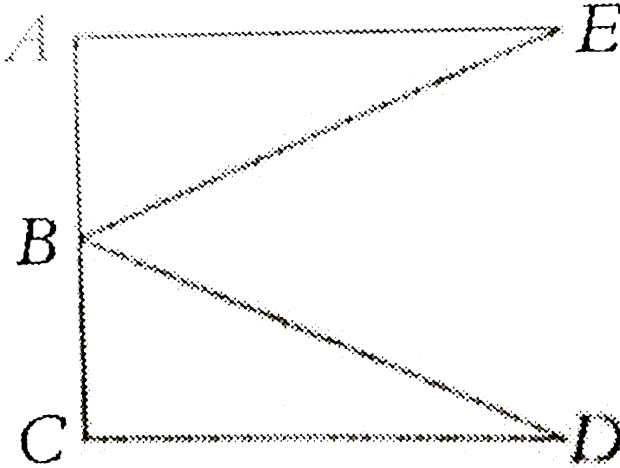
A. square

B. rectangle

C. rhombus

D. isosceles trapezium.

Answer: D

5.

In the given figure, $\overline{AE} \mid\mid \overline{CD}$, AB=BC, and AE=CD. If $\overline{AC} \perp \overline{CD}$ and $\angle AEB = 35°$, then find $\angle DBE$.

A. $70°$

B. $65°$

C. $55°$

D. $50°$

Answer: A

6. The measure of one of the angles of an isosceles triangle is $94°$. Which of the following is definitely the measure of one of the other angles of the given triangle ?
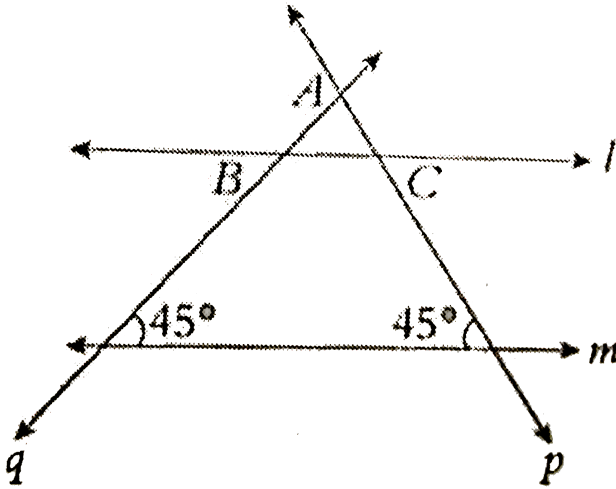
   A. $94°$

   B. $86°$

   C. $43°$

   D. $46°$

Answer: C

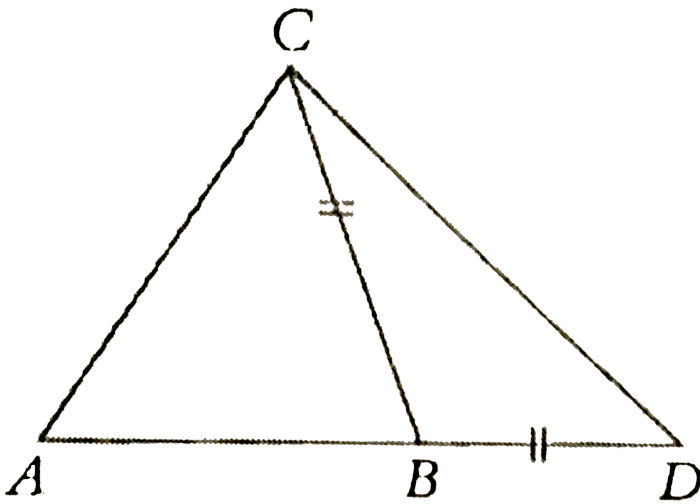**7.** In the given figure, if l||m, then what type of a triangle is ABC ?

A. Scalene

B. Isosceles

C. Right angled

D. Both (b) and (c)

Answer: D

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8.

In the given figure, $\angle ACB = 60°$, $\angle CAB = 50°$ and $BC = BD$. Find $\angle BDC$.
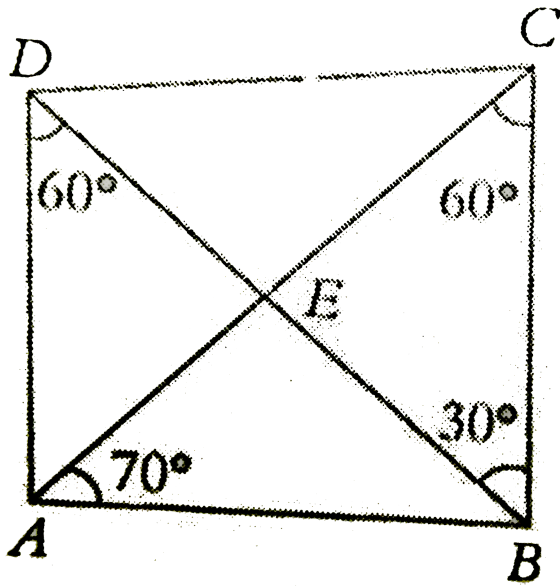
A. $35°$

B. $60°$

C. $45°$

D. $50°$

Answer: A

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9.

In   the   given   figure,   ABCD   is   a   quadrilateral

$\angle ADB = 60°$, $\angle BAC = 70°$, $\angle DBC = 30°$, and

A. $30°$

B. $40°$

C. $50°$

D. $60°$

Answer: A

10. One angle of a parallelogram is thrice its adjacent angle. Which of the following is one of its angles ?

A. $30°$

B. $45°$

C. $120°$

D. $100°$

Answer: B

11. Which of the following statement is true ?

A. Every trapezium is a parallelogram

B. Every square is a rhombus.

C. Every rectangle is a square

D. Every parallelogram is a rectangle .

Answer: B

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12. Match the following Column A and Column B

Column

27. In a

the

28. In a

the

29. Cer

30. Exc