



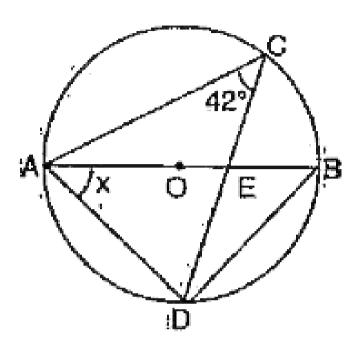
MATHS

BOOKS - S CHAND IIT JEE FOUNDATION

CIRCLES

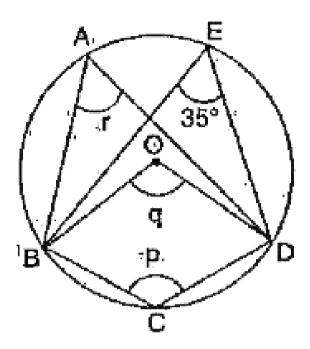
Solved Examples

1. In the given circle with diameter AB find the value of x.





2. O is the centre of the circle. Find the values of p, q and r.



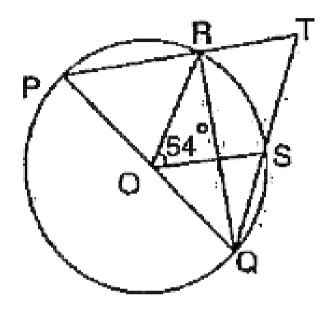


3. If the length of a chord of a circle is equal to its radius, then find the angle subtended by it at the minor arc of the circle.



4. PQ is the diameter of the given circle, whose centre is O. Given,

 $\angle Ros = 54^{\circ}$, calculate $\angle RTS$.





5. The length of the common chord of two circles of radii 15 and 20, whose centres are 25 units apart, is



6. If O is the centre of the given circle and BC = AO, then which of the following statements is true?

A.
$$2x = y$$

D.
$$x = 2y$$

Answer: B



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Question Bank

1. If the two circles C_1 and C_2 have three points in common, then which of the following is correct?

A. C_1 and C_2 are concentric

- B. C_1 and C_2 are the same circle
- C. C_1 and C_2 have different centres
- D. None of the above

Answer: B



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- 2. Which of the following pairs of lines can be parallel?
- 1. Two tangents to a circle.
- 2. Two diameters of a circle.
- 3. A chord of circle and a tangent to a tangent to a circle.
- 4. Two chords of a circle.

Select the correct answer using the codes given below:

- A. 1, 2 and 3
- B. 2, 3 and 4
- C. 1, 3 and 4

D. 1, 2 and 4

Answer: C



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- **3.** Three circles with equal radii touch each other externally. The figure formed by joining the centres of these circles is
 - A. an isosceles triangle
 - B. an equilateral triangle
 - C. a scalene triangle
 - D. a right angled triangle

Answer: B



4. Two non-intersecting circles one lying inside another arc of diameters a and b. The minimum distance between their circumferences is c. The distance between their centres is

A.
$$a-b-c$$

B.
$$a+b-c$$

$$\mathsf{C.}\,\frac{1}{2}(a-b-c)$$

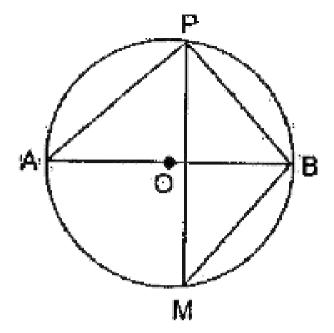
D.
$$\frac{1}{2}(a-b) - c$$

Answer: D



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5. In the given figure, if AB is the diameter of the circle and PM the internal bisector of $\angle APB$, then the measure of angle ABM is



A. 15°

B. $30\,^\circ$

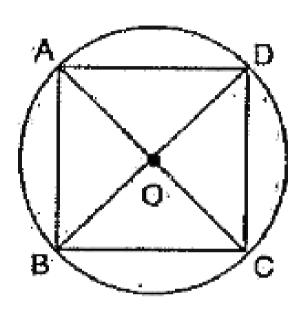
C. 45°

D. $60\,^\circ$

Answer: C



6. A square is inscribed in a circle with centre O. What angle does each side subtend at the centre O ?



A. $45^{\,\circ}$

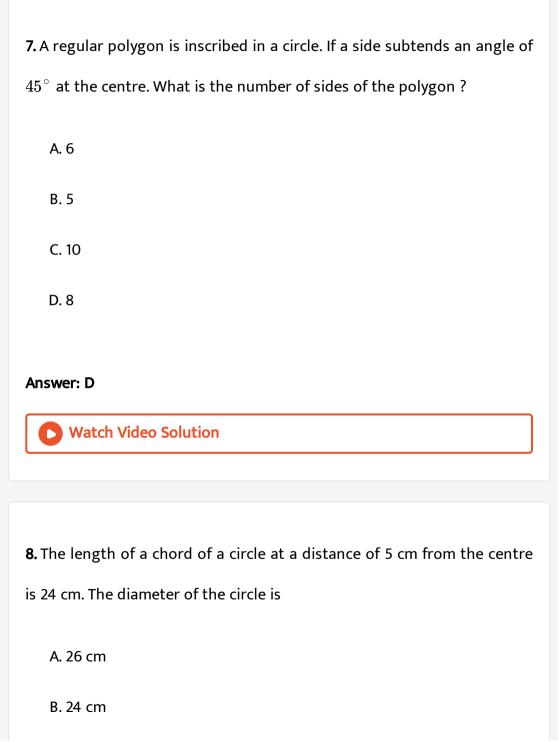
B. $60\,^\circ$

C. $75\,^\circ$

D. $90\,^\circ$

Answer: D





D. 12 cm
Answer: A
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9. In a circle of radius 25 cm, a chord is drawn at a distance of 7 cm from
the centre. Find the length of the chord.
A. 24 cm
B. 48 cm
C 50 am
C. 50 cm
D. 36 cm
Answer: B
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C. 13 cm

10. A chord 6 cm long is at a distance of 4 cm from the centre of a circle. Find the length of a chord which is at a distance of 3 cm from the centre of the circle.

- A. 10 cm
- B. 6 cm
- C. 8 cm
- D. 12 cm

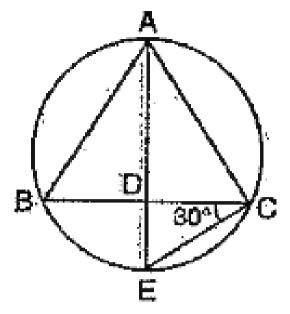
Answer: C



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11. In the given figure, ΔABC is inscribed in a circle and the bisector of

 $\angle A$ meets BC in D and the circle in E. If $\angle ECD = 30^{\circ}$, what is $\angle A$?



A. 60°

B. 45°

c. 70°

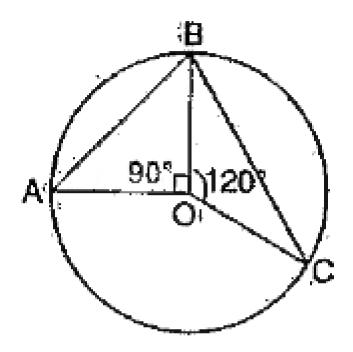
D. 150°

Answer: A



12. O is the centre of a circle

$$\angle AOB = 90^{\circ} \ \ {
m and} \ \ \angle BOC = 120^{\circ}$$
 . $\angle ABC$ is equal to



A. 150°

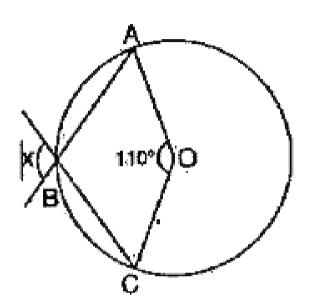
B.
$$210^{\circ}$$

C.
$$75^{\circ}$$

D.
$$105^{\circ}$$

Answer: C

13. In the given figure, O is the centre of the circle. The value of x is



A. 75°

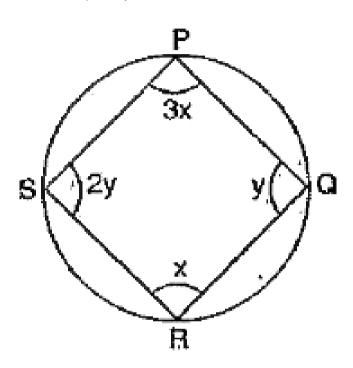
B. 55°

C. 125°

D. 110°

Answer: C

14. PQRs is a cyclic quadrilateral. Find the measure of $\angle P$ and $\angle Q$.



A.
$$135^{\circ}$$
 , 60°

B.
$$60^{\circ}\,,\,120^{\circ}$$

C.
$$60^{\circ}$$
 , 90°

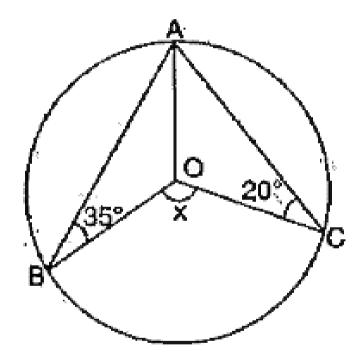
D.
$$100^{\circ}$$
 , 120°

Answer: A



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15. If $\angle ABO=35^{\circ}$ and $\angle ACO=20^{\circ}$, then $\angle x$ is



- A. 55°
- B. $110\,^\circ$
- C. 80°

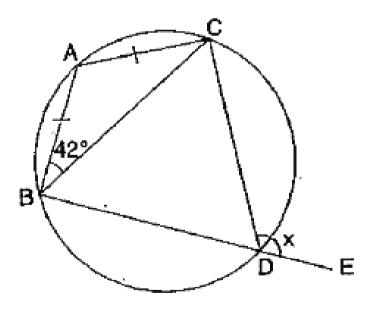
Answer: B



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16. ABC is an isosceles triangle in the given circle with centre O.

$$\angle ABC = 42^{0}$$
, $\angle CDE$ is equal to



A. $84\,^\circ$

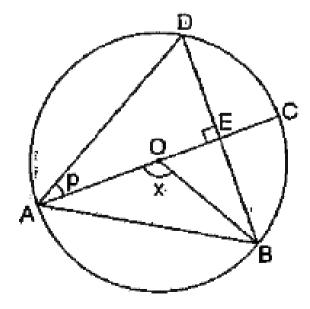
- B. 138°
- C. 96°
- D. 148°

Answer: C



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17. In the given figure, AC is the diameter of the circle with centre O. Chord BD is perpendicular to AC. Express p in terms of x.



A.
$$x/2$$

B.
$$90^\circ\,+x/2$$

C.
$$90^{\circ}\,-x/2$$

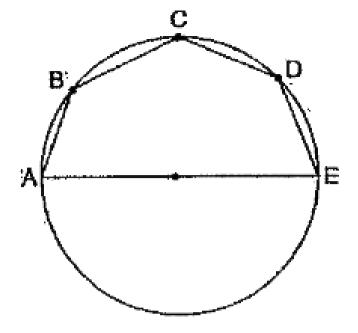
D.
$$180^{\circ}-x$$

Answer: C



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18. In the given figure, AE is the diameter of the circle. Write down the numerical value of $\angle ABC + \angle CDE$.



A. 360°

B. $540\,^\circ$

C. 180°

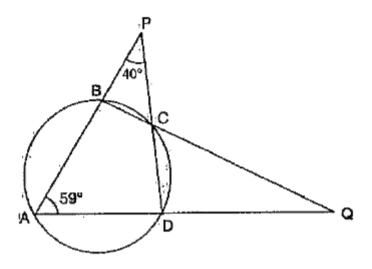
D. $270\,^\circ$

Answer: D



19. In the given figure, $\angle PAQ = 59^{\circ}, \angle APD = 40^{\circ}$, then what is

 $\angle AQB$?



A. 19°

B. 20°

C. 22°

D. 27°

Answer: C



20.

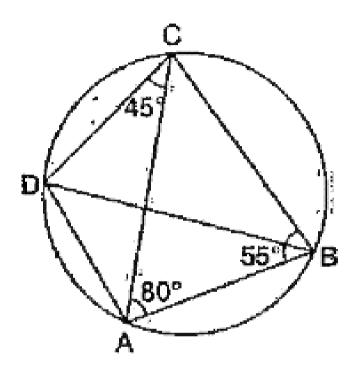
In

the given

figure

 $\angle CAB = 80^{\circ}, \angle CBA = 55^{\circ} \; ext{ and } \angle DCA = 45^{\circ}.$ The statement BD is

the diameter is:



A. False

B. cannot be determined

C. True

D. Not possible

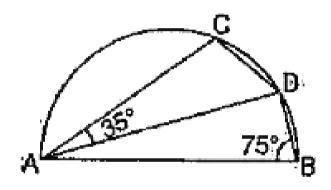
Answer: C



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21. In the given figure, C and D are points on a semi circle described on

AB as diameter. $\angle ABD=75^{\circ}~~{
m and}~~\angle DAC=35^{\circ}$. What is $\angle BDC$?



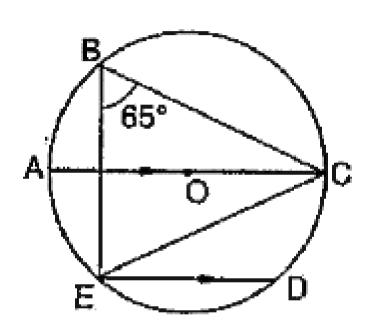
A. 130°

B. 110°

C. 90°

D. 100°

22. In the adjoining figure, chord ED is parallel to the diameter of the circle. If $\angle CBE=65^{\circ}$, then what is the value of $\angle DEC$?



A. $35\,^\circ$

B. 55°

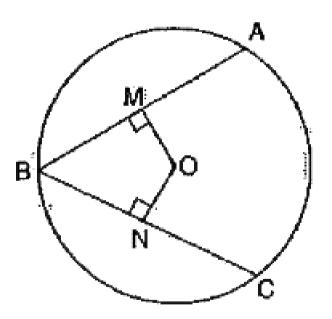
C. 45°

D. 25°

Answer: D

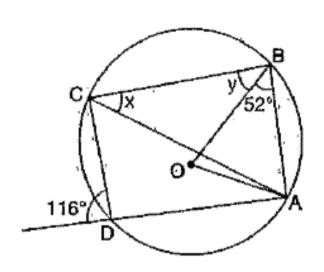


23. AB and BC are two equal chords of a circle with centre O. $OM \perp AB$ and $ON \perp BC$. OB is joined. State if each of the following statements is true or false. Give reasons in each case.



- (i) OM = ON
- (ii) $\Delta OMB\cong \Delta ONB$
- (iii) BO bisects $\angle ABC$

24. In the given figure, find x + y.



A. 116°

B. $102\,^\circ$

C. 64°

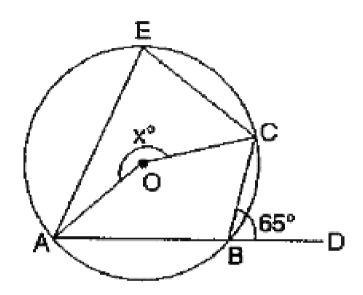
D. 76°

Answer: B



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25. In the given figure, O is the centre of the circle. ABD is a straight line and $\angle CBD=65^\circ$. Find reflex $\angle AOC$ (marked x°).



- A. 130°
- B. 230°
- C. 190°
- D. 65°

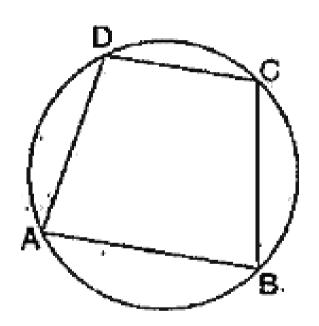
Answer: B

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Self Assessment Sheet

1. Which of the following statements is not TRUE?



- A. The diameter is the greatest chord that can be drawn in a circle.
- B. A straight line cannot intersect a circle in more than two points.
- C. A diameter bisects a circle.

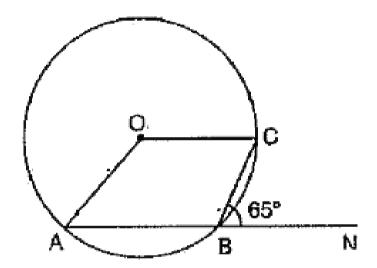
D. In the figure
$$\angle A = \angle C$$
 and $\angle B = \angle D$

Answer: D



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2. O is the centre of the circle, ABN is a straight line. Find $\angle AOC$.



A. 128°

B. 132°

C. 130°

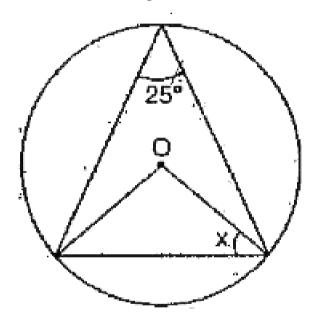
D. 135°

Answer: C



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3. Find the size of the angle marked x.



A. 60°

B. $65^{\,\circ}$

C. 70°

D. 55°

Answer: B



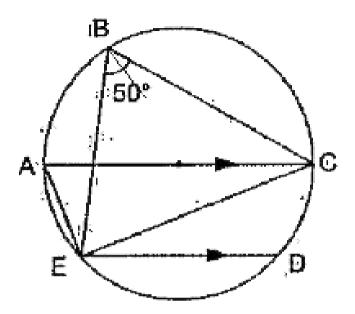
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- **4.** The length of a chord of a circle of radius 10 cm is 12 cm. Find the distance of the chord from the centre of the circle.
 - A. 6 cm
 - B. 5 cm
 - C. 8 cm
 - D. 7 cm

Answer: C



5. Chord ED||diameter AC. Determine $\angle CED$.



- A. 50°
- B. 45°
- C. 55°
- D. 40°

Answer: D



6. The measure of the line segment joining the centre of a circle to the mid-point of a chord is :

A. twice the measure of the chord

B. half the measure of the chord

C. equal to the measure of the chord

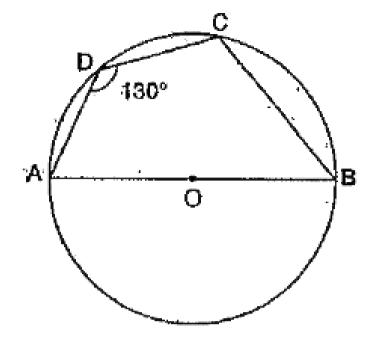
D. None of the above

Answer: D



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7. ABCD is a cyclic quadrilateral whose side AB is a diameter of the circle through A, B, C, D. If $\angle ADC=130^\circ$, find $\angle BAC$.



A. 40°

B. $50^{\,\circ}$

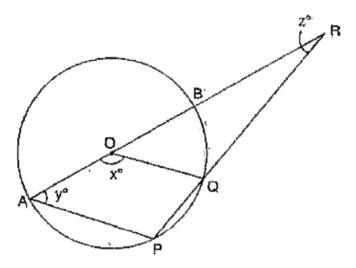
C. 60°

D. $30\,^\circ$

Answer: A



8. O is the centre of the circle APQB, AOBR, PQR are straight lines. Find x in terms of y and z.



A.
$$x = y + z$$

$$B. x = 2y + z$$

$$\mathsf{C.}\, x = y + 2z$$

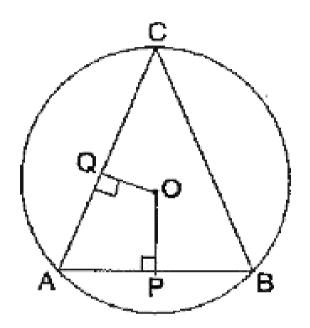
D.
$$x = 2(y + z)$$

Answer: D



9. O is the centre of the circle ABC, radius 5 cm, AB = 8 cm, AC = 6 cm.

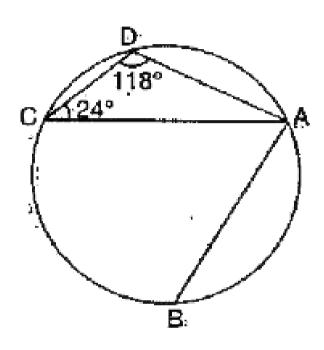
Calculate the lengths of the perpendiculars OP, OQ from O to AB, AC.



- A. 3 cm, 4 cm
- B. 4 cm, 3 cm
- C. 2 cm, 3 cm
- D. 3.5 cm, 2.5 cm

Answer: A

10. AB, AC are equal chords of the circle ABCD. Calculate $\angle BAD$.



A. 100°

B. 94°

C. 96°

D. 80°



Unit Test

- A. circumcentre
- B. centroid
- C. orthocentre
- D. incentre

Answer: A



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2. The circumcentre in a right triangle is:

A. inside the triangle

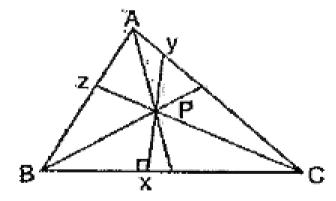
- B. outside the triangle
- C. on one of the perpendicular sides
- D. on the hypotenuse

Answer: D



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3. P is the incentre of Δ ABC. Which of the following statements is true ?



- A. AZ = BZ
- B. AY = BX

4. The incentre of a triangle coincides with the circumcentre, orthocentre and centroid in case of :

A. an isosceles triangle

B. an equilateral triangle

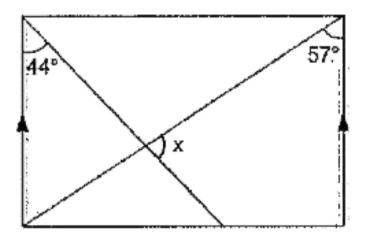
C. a right - angled triangle

D. a right - angled isosceles triangle

Answer: B



5. Find x



A. 78°

B. 80°

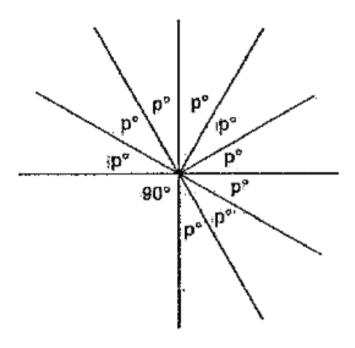
C. 75°

D. 79°

Answer: D



6. Calculate the size of angle p.



A. 20°

B. 30°

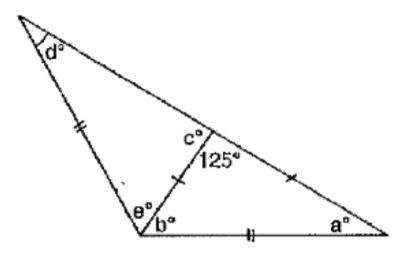
C. 40°

D. $25^{\,\circ}$

Answer: B



7. Calculate the size of the labelled angles



A.
$$a=27.5^{\circ}$$
 , $b=27.5^{\circ}$, $c=55^{\circ}$, $d=27.5^{\circ}$, $e=97.5^{\circ}$

B.
$$a=28^{\circ}$$
 , $b=27^{\circ}$, $c=60^{\circ}$, $d=28^{\circ}$, $e=102^{\circ}$

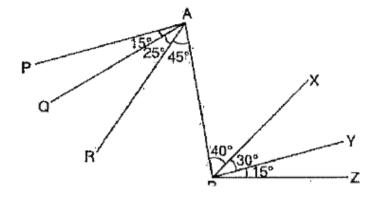
C.
$$a=30^\circ, b=25^\circ, c=55^\circ, d=30^\circ, e=95^\circ$$

D. None of these

Answer: A



8. Find pairs of parallel lines

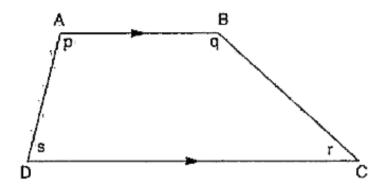


- A. AR, BX, AP, BY
- B. AQ, BZ, AP, BX
- C. AQ, BY, AP, BZ
- D. AQ, BX, AR, BZ

Answer: C



9. In the figure, AB||CD then



A.
$$p+r=q+s$$

B.
$$p - r = q - s$$

$$\mathsf{C.}\, p+s=q+r$$

$$\operatorname{D.} p - q = s - r$$

Answer: B



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10. How many sides does a polygon have if the sum of its interior angles is 30 right angles ?

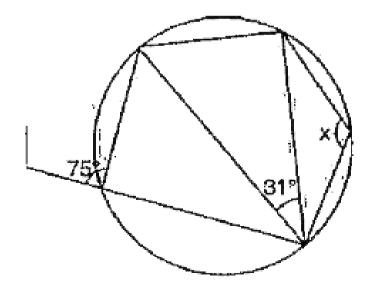
- A. 15
- B. 17
- C. 19
- D. 20

Answer: B



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11. Find x



A. 110° B. 104° C. 108° D. 106° Answer: D **View Text Solution** 12. Tick against the correct alternative. The orthocentre of a triangle is the point of concurrency of its. A. medians B. angle bisectors C. perpendicular bisectors of sides D. altidues drawn to sides from opposite vertices. **Answer: D**

13. Match correctly

- (a) centroid (1) medians of $a\Delta$ (b) incentre (2) centre of the circumcircle point of intersection
- of the perp. bisectors of the sides of $a\Delta$ (c) Circumcentre (3) point of intersection of the medians of $a\Delta$ (d) concurrent (4) centre of the incircle point of intersection of the

angle bisectors of a Δ



14. The lengths of the sides of a Δ ABC are given below. In which of these cases are angles of the triangle in the increasing order of magnitude as

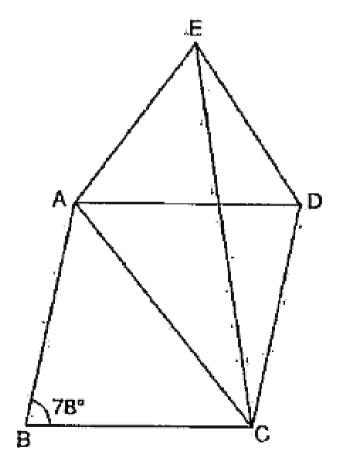
 $\angle C$, $\angle B$, $\angle A$.

- B. BC = 10 cm, CA = 6.9 cm, AB = 5.4 cm
- C. BC = 3 cm, CA = 4 cm, AB = 5 cm
- D. BC = 3.5 cm, CA = 3 cm, AB = 4 cm



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15. ABCD is a rhombus and AED is an equilateral triangle. E and C lie on opposite sides of AD. If $\angle ABC=78^\circ$, calculate $\angle DCE$.



- A. $20^{\,\circ}$
- B. 21°
- C. 22°
- D. 19°

Answer: B



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16. Solve the system of linear equations for x and y:

x + y = 15

3x - 2y = -5

A. 6, 12

B. 8, 16

C. 5, 10

D. 7, 14

Answer: C



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17. A regular polygon is inscribed in a circle. If a side subtends an angle of 30° at the centre, what is the number of its sides ?

- A. 10
- B. 8
- C. 6
- D. 12

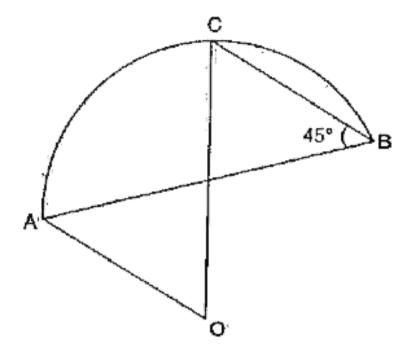
Answer: D



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18. Answer True or False. ACB is an arc of a circle with centre O and

 $\angle ABC = 45^{\circ}$, then, $AO \perp OC$.





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19. Consider the following statements

- 1. The bisectors of all the four angles of a parallelogram enclose a rectangle.
- 2. The figure formed by joining the midpoints of the adjacent sides of a rectangle is a rhombus.
- 3. The figure formed by joining the midpoints of the adjacent sides of a

rhombus is a square. Which of these statements are correct? A. 1 and 2 B. 2 and 3 C. 3 and 1 D. 1, 2 and 3 Answer: A **Watch Video Solution** 20. If the sum of the diagonals of a rhombus is 12 cm, and its perimeter is $8\sqrt{5}$ cm, then the lengths of the diagonals are : A. 6 cm and 6 cm B. 7 cm and 5 cm

C. 8 cm and 4 cm

D. 9 cm and 3 cm

Answer: C

