



MATHS

BOOKS - CENGAGE

TANGENTS TO CIRCLES

Test Yourself Level 1

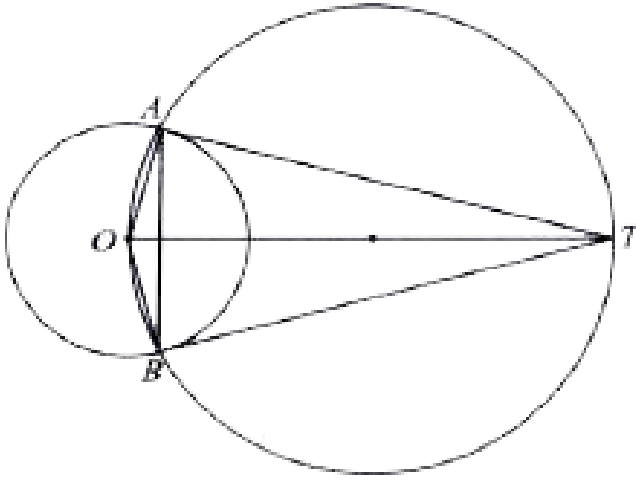
1. Refer to the figure for the problem below in which AT and

BT are tangent from T to circle centre O.

(a) If $\widehat{ATB} = 65^\circ$, find \widehat{AOT}

(b) If $\widehat{ATB} = 64^\circ$, find \widehat{AOB}

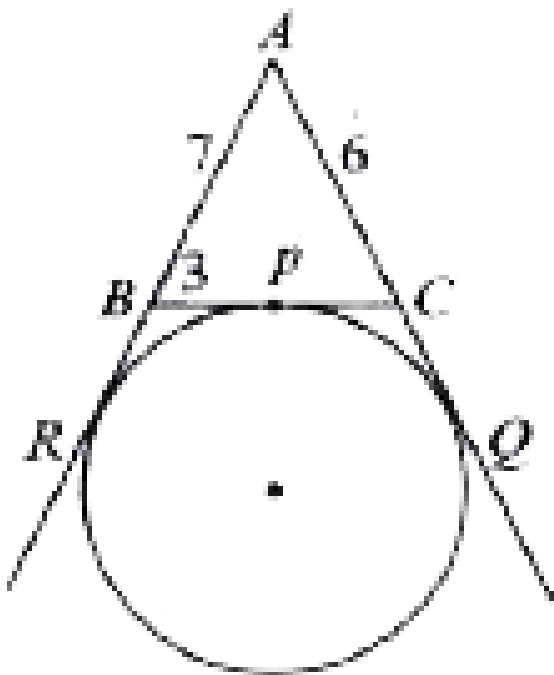
(c) If $\widehat{ATB} = 40^\circ$, find \widehat{AB}



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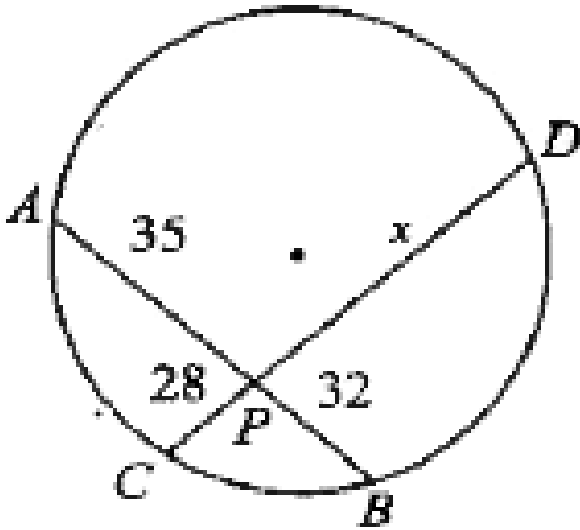
2. In $\triangle ABC$, $BC = 3\text{cm}$, $CA = 6\text{cm}$, $AB = 7\text{cm}$, a circle is drawn to touch AB produced at R , AC produced at Q , and

BC at P, Find the length of AR and CP



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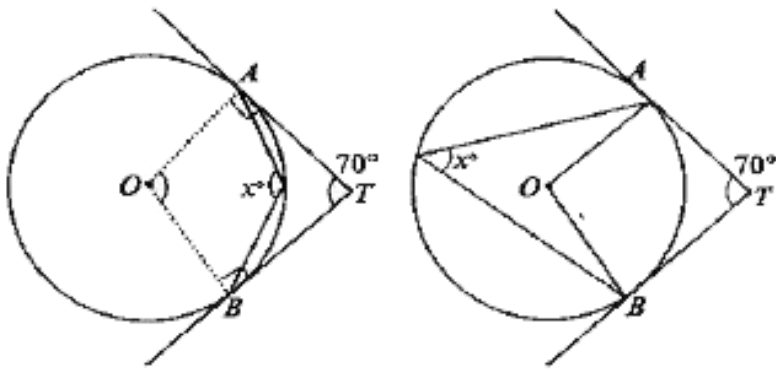
3. Find the value of x (all measurements are in centimetres).



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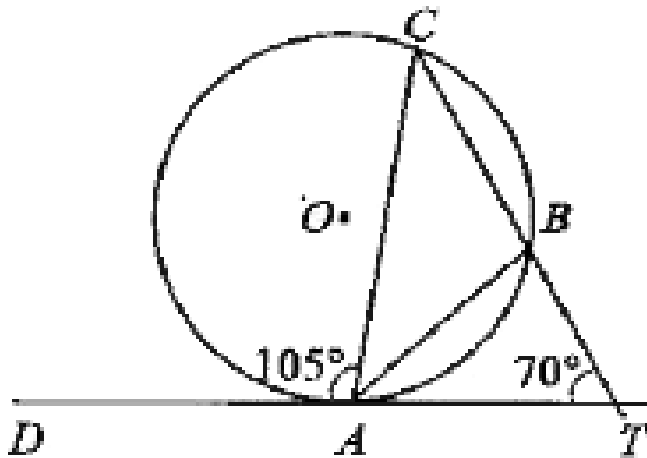
Test Yourself Level 2

1. In the figure, TA and TB are tangents to the circles. Find x in both cases.



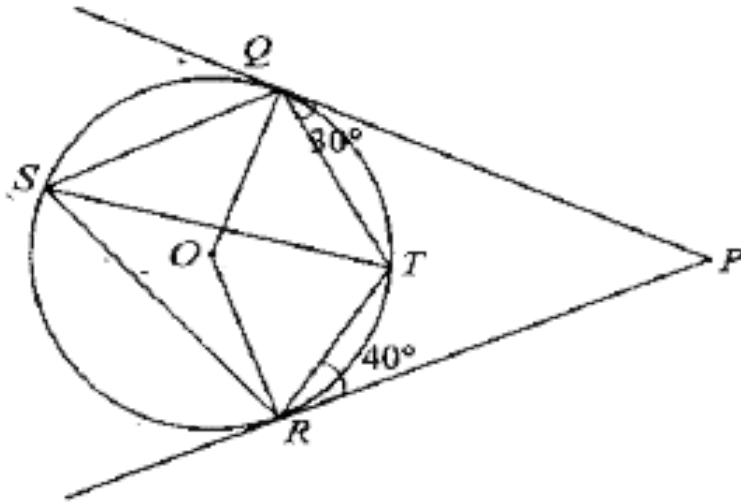
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2. In the figure, TA is a tangents to the circle. Find the angles of ΔABC .



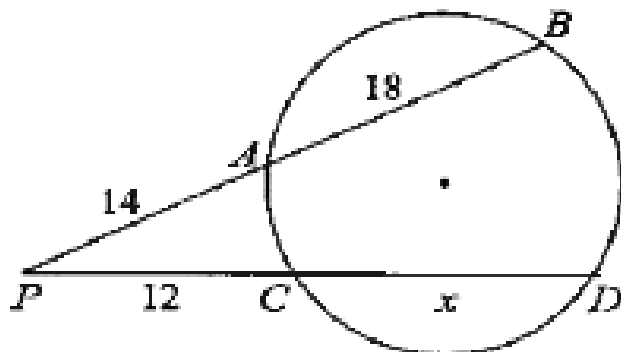
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3. In the figures, PQ and PR are tangents to the circle with centre O . Find $\angle RSQ$, $\angle RTQ$, and \widehat{RPQ}



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4. Find the value of x in the following figures.

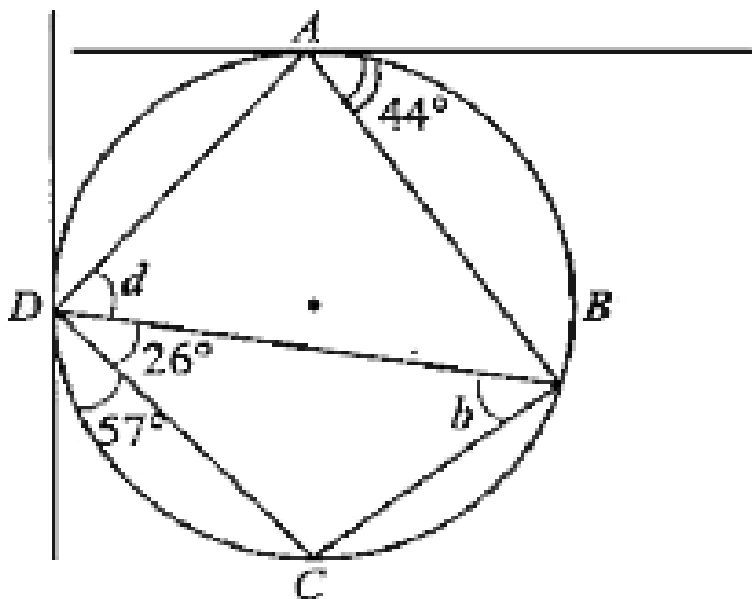


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Test Yourself Level 3

1. In the figure, ABCD is a cyclic quadrilateral, AX and DY are tangents, $\widehat{XAB} = 44^\circ$, $\widehat{YDC} = 57^\circ$, and $\widehat{BDC} = 26^\circ$.

Find the angles of quadrilateral $ABCD$

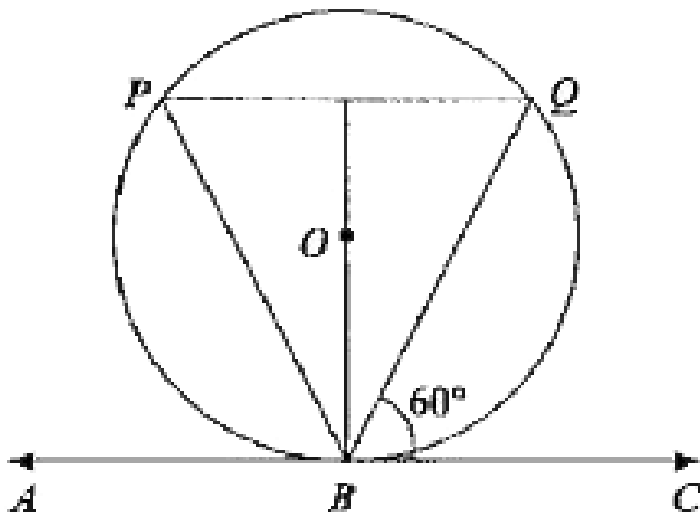


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2. Two spherical balls of radii 10 cm and 5 cm lie on a plane touching each other. Find the distance between the point where the balls touch the plane.

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3. If ABC is tangent to the circle at point B whose centre is O , PQ is a chord parallel to AC and $\angle QBC = 60^\circ$, then $\angle QBP$ is equal to



- A. 30°
- B. 60°
- C. 90°
- D. 80°

Answer: B



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4. The pair of tangents AP and AQ drawn from an external point to a circle with centre O are perpendicular to each other. If the length of each tangent is 5 cm , then radius of the circle is

A. 10 cm

B. 7.5 cm

C. 5 cm

D. 2.5 cm

Answer: C

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5. If PA and PB are tangents to the circle with centre O such that $\angle APB = 50^\circ$ then $\angle OAB$ is equal to

A. 50°

B. 30°

C. 40°

D. 25°

Answer: D

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6. If radii of two concentric circles are 4 cm and 5 cm Then the length of the chord of one circle which is tangent to the other circle is

A. 3 cm

B. 6 cm

C. 9 cm

D. 1 cm

Answer: B



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7. IF two tangents inclined at an angle of 60° are drawn to a circle of radius 3 cm , then the length of each tangent is

equal to

A. $\frac{3\sqrt{3}}{2}$ cm

B. 6 cm

C. 3 cm

D. $3\sqrt{3}$ cm

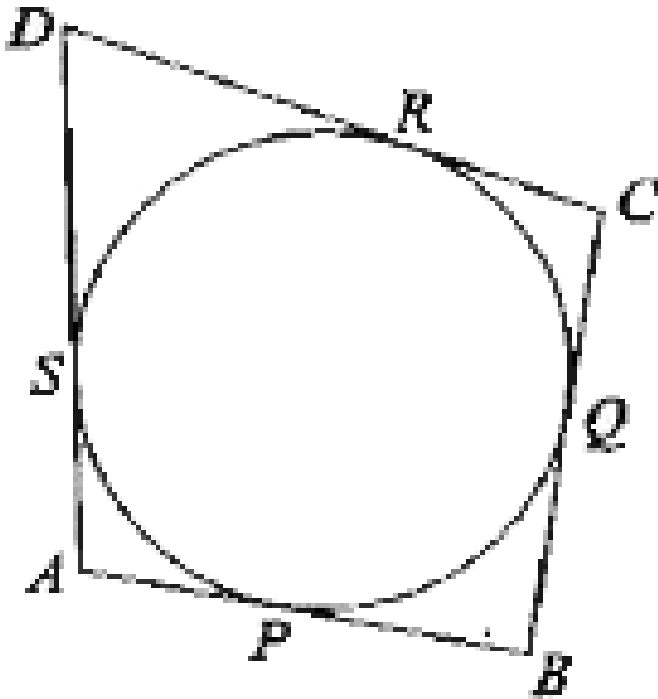
Answer: D



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8. A quadrilateral ABCD is drawn to circumscribe a circle such that its sides AB, BC, CD and DA touch the circle at P, Q, R and S, respectively. If AB = x cm, BC = 7 cm, CR = 3 cm

and $AS = 5$ cm , then $x = ?$

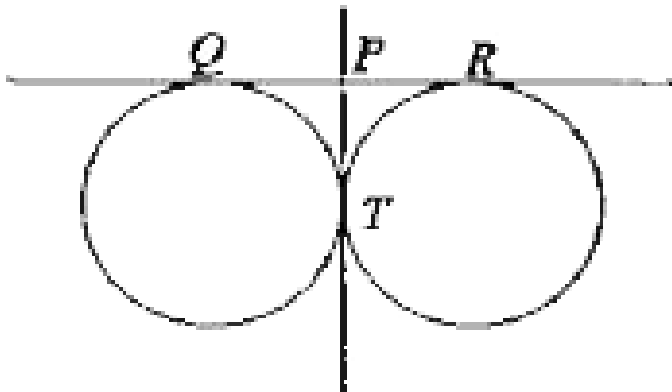


- A. 10 cm
- B. 8 cm
- C. 9 cm
- D. 7 cm

Answer: C

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9. QR is a common tangent to the given circles touching each other externally at the point T. The tangents at T meets QR at P. if $PT = 3.8$ cm , then the length of QR (in cm) is



A. 3.8

B. 7.6

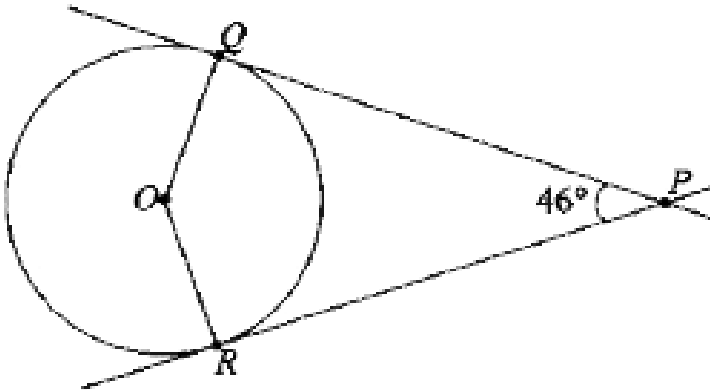
C. 5.7

D. 1.9

Answer: B

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10. If PQ and PR are two tangents to a circle with centre O . if $\angle QPR = 46^\circ$, then $\angle QOR$ is equal to



A. 67°

B. 46°

C. 44°

D. 134°

Answer: D



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11. In a right triangles ABC right angled at B, $BC = 12$ cm and $AB = 5$ cm . The radius of the circle inscribed in the triangle (in cm) is

A. 4

B. 3

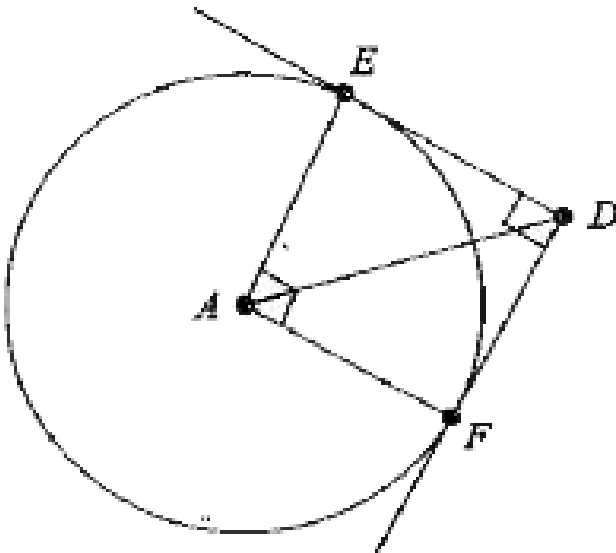
C. 2

D. 1

Answer: C

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12. In figure DE and DF are tangents from an external point D to a circle with centre A. if $DE = 5$ cm and $DE \perp DF$, then radius of the circle is



A. 3 cm

B. 5 cm

C. 4 cm

D. 6 cm

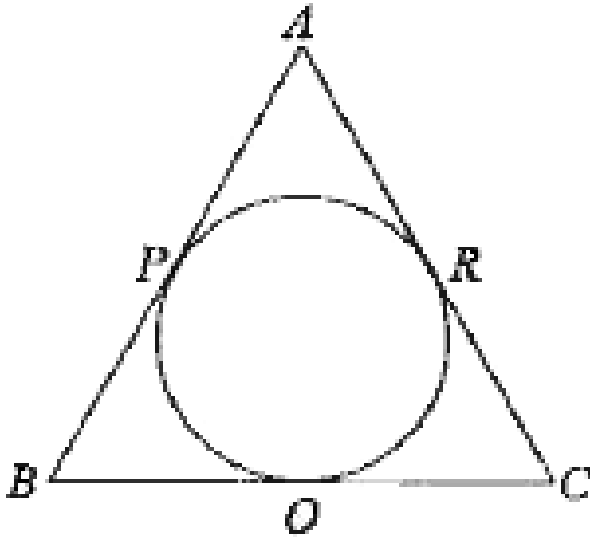
Answer: B



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13. In figure , the sides AB, BC and CA of triangle ABC, touch a circle at P,Q and R, respectively . If $PA = 4$ cm , $BP = 3$ cm and

$AC = 11$ cm , then length of BC is

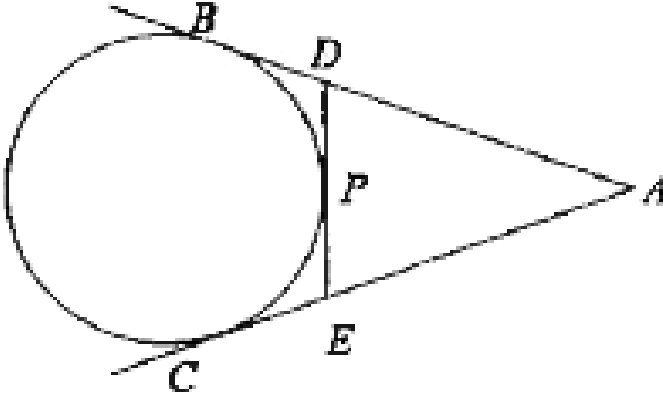


- A. 11 cm
- B. 15 cm
- C. 14 cm
- D. 10 cm

Answer: D

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14. In the figure if $AB = 8$ cm and $PE = 3$ cm then $AE =$

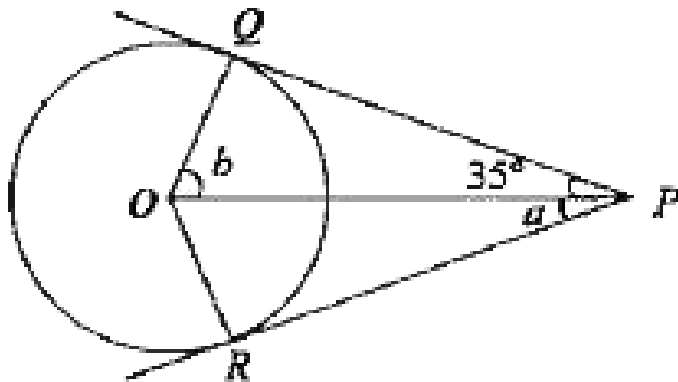


- A. 11 cm
- B. 7 cm
- C. 5 cm
- D. 3 cm

Answer: C

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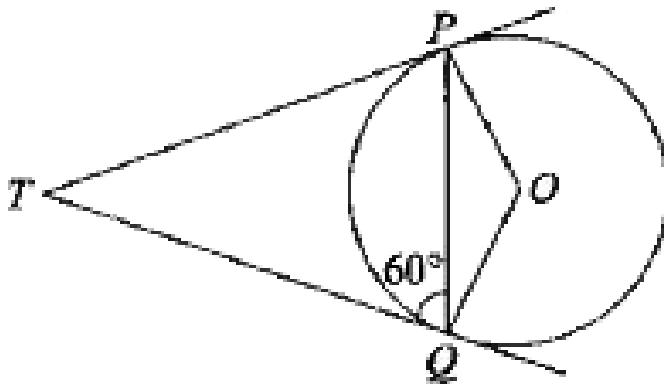
15. In the figure , PQ and PR are the tangents drawn from P to a circle with centre O. if $\angle OPQ = 35^\circ$ then



- A. $a = 30^\circ, b = 60^\circ$
- B. $a = 35^\circ, b = 55^\circ$
- C. $a = 40^\circ, b = 50^\circ$
- D. $a = 45^\circ, b = 45^\circ$

Answer: B

16. In the figure , if TP and TQ are tangents drawn from an external point T to a circle with centre O such that $\angle TQP = 60^\circ$, then $\angle OPQ =$



A. 25°

B. 60°

C. 40°

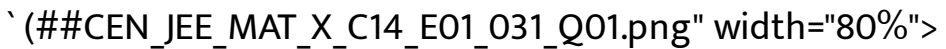
D. 30°

Answer: D



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17. There are two concentric circles with centre O. PR and PQ are tangents to the inner circle from point P lying on the outer circle. If PR = 7.5 cm, then PS is equal to

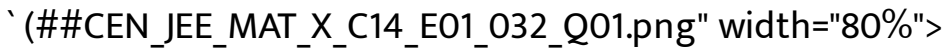


- A. 10 cm
- B. 12 cm
- C. 15 cm
- D. 18 cm

Answer: C

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18. In figure ,PR = ?

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A. 20 cm

B. 22 cm

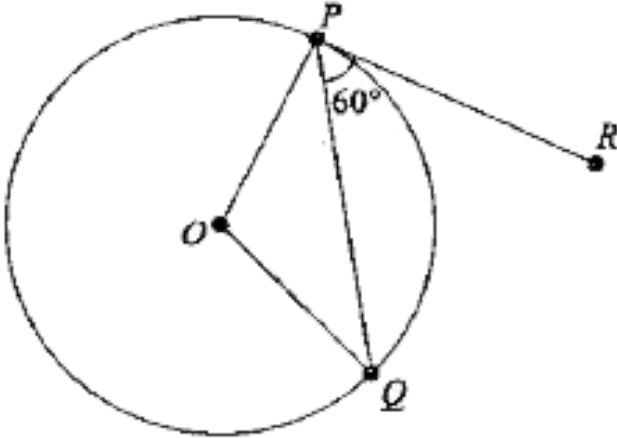
C. 24 cm

D. 26 cm

Answer: D

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19. In figure PR is tangent to the circle at P and O is the centre of the circle. The value of $\angle POQ$ is



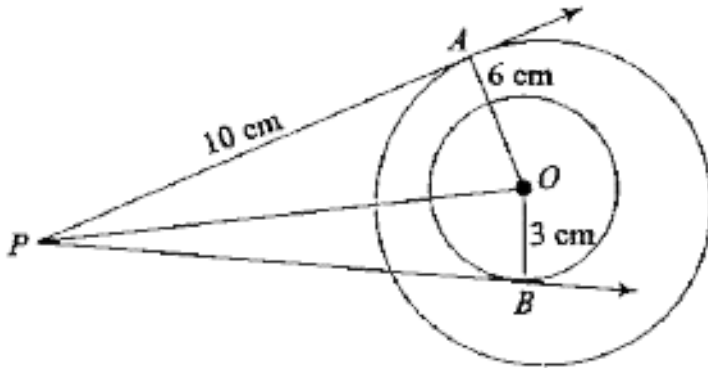
- A. 110°
- B. 100°
- C. 120°
- D. 90°

Answer: C



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20. In figure , if $AP = 10$ cm, then BP



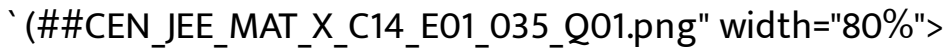
- A. $\sqrt{91}$ cm
- B. $\sqrt{127}$ cm
- C. $\sqrt{119}$ cm
- D. $\sqrt{109}$ cm

Answer: B



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21. In figure , if $AB = 12$ cm , $BC = 8$ cm and $AC = 10$ cm , then
AD is



A. 5 cm

B. 4 cm

C. 6 cm

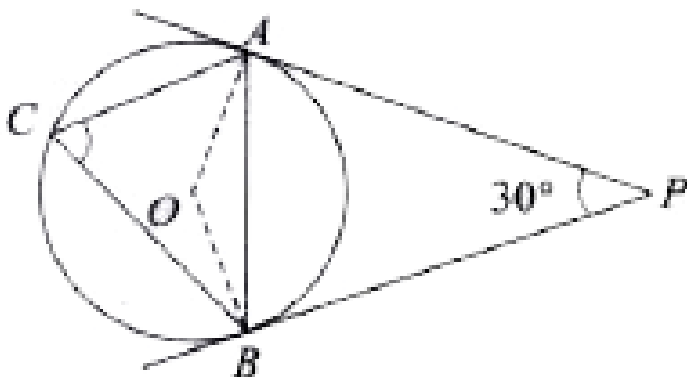
D. 7 cm

Answer: D



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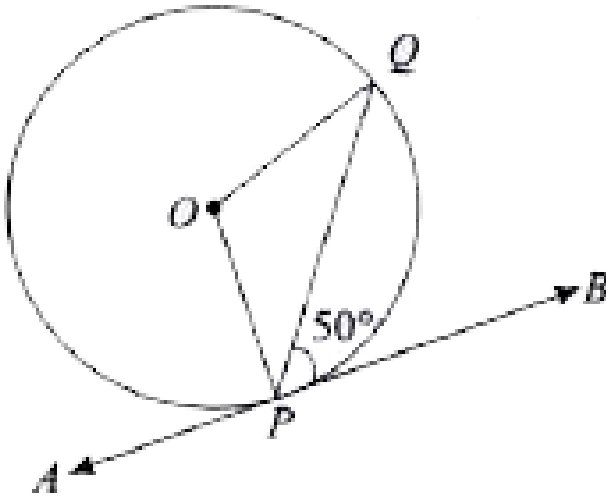
22. In figure , tangents PA and PB are drawn to a circle such that $\angle APB = 30^\circ$ and chord AC is drawn parallel to the tangent PB then $\angle ABC =$



- A. 60°
- B. 50°
- C. 30°
- D. none of these

Answer: C

23. In figure , APB is a tangent to a circle with centre O at point P, If $\angle QPB = 50^\circ$, then the measure of $\angle POQ$ is

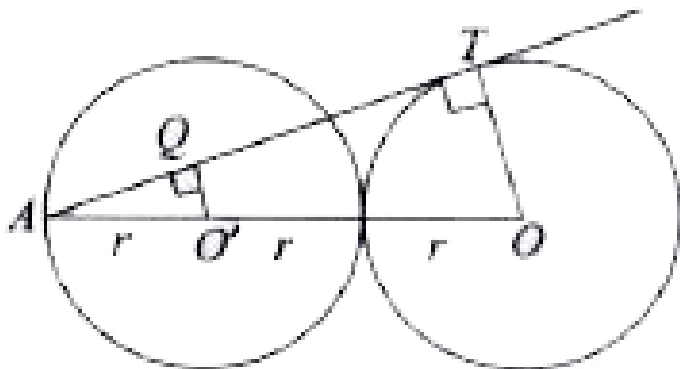


- A. 100°
- B. 120°
- C. 140°
- D. 150°

Answer: A

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24. Two circles of same radius r centred at O and O' touch each other at P as shown in the figure, if OO' is produced to meet the circle $C(O'r)$ at A and AT is a tangent to the circle $C(O,r)$ such that $O'Q \perp AT$. Then $AO : AO' =$



A. $\frac{3}{2}$

B. 2

C. 3

D. $\frac{1}{4}$

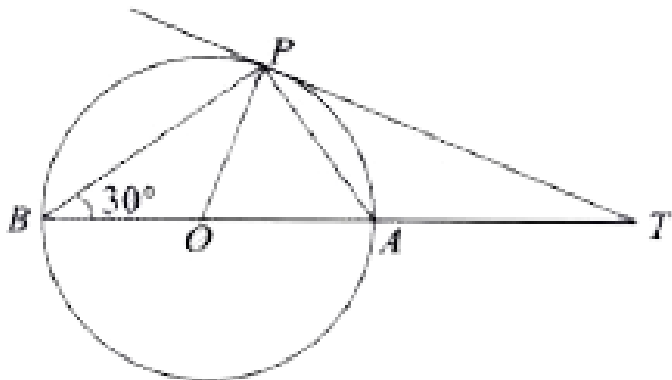
Answer: C



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25. In figure , BOA is a diameter of circle and the tangent at point P meets BA produced at T if $\angle PBO = 30^\circ$ then

$\angle PTA =$



A. 30°

B. 60°

C. 90°

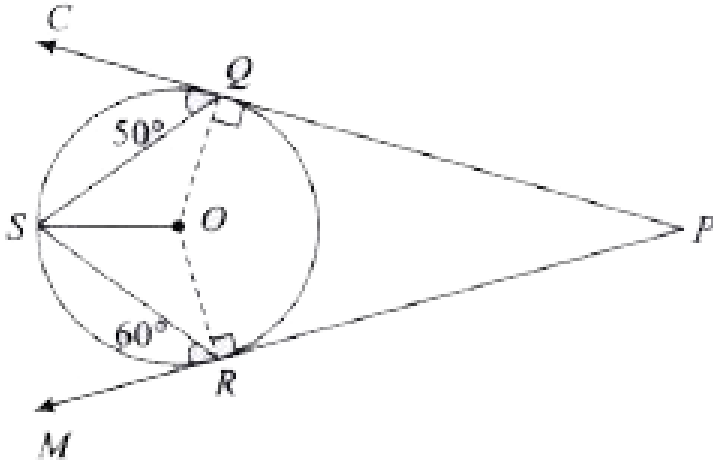
D. 45°

Answer: A



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26. In the figure , PQ and PR are tangent to the circle with centre O. Also, S is a point on the circle such that $\angle SQC = 50^\circ$ and $\angle SRM = 60^\circ$, then $\angle QSR =$



A. 40°

B. 70°

C. 80°

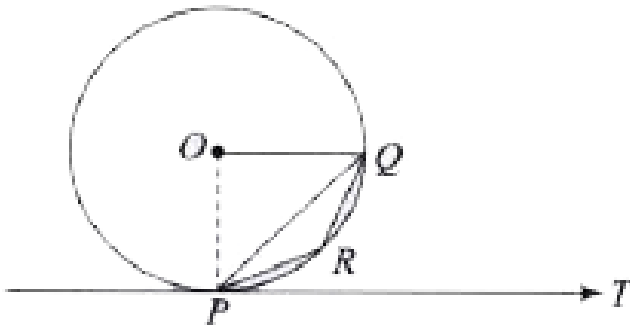
D. 45°

Answer: B



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27. In the figure, PQ is a chord of a circle and PT is a tangent at P such that $\angle QPT = 60^\circ$, then $\angle PRQ =$



- A. 100°
- B. 110°
- C. 120°
- D. 150°

Answer: C



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28. If the figure , CP and CQ are tangents from an external point C to a circle with centre O. AB is another tangent which touches the circle at R. If CP = 11 cm and BR = 4 cm , find the length of BC.

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A. 6 cm

B. 7 cm

C. 8 cm

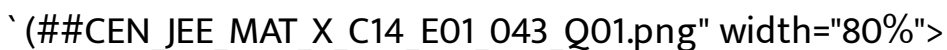
D. 9 cm

Answer: B



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29. In the figure , CP and CQ are tangent to a circle with centre O. ARB is another tangent touching the circle R . If CP = 11 and BC = 7 cm then what is the length of BR?

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A. 2 cm

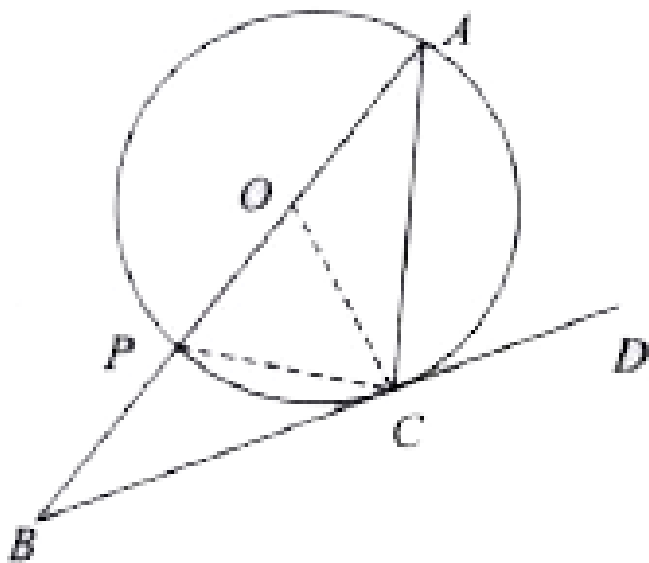
B. 4 cm

C. 6 cm

D. 8 cm

Answer: B

30. In the figure , O is the centre of the circle and BCD is tangent to it at C . Find the value of $\angle BAC + \angle ACD$



A. 90°

B. 80°

C. 45°

D. 60°

Answer: A



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31. O is the centre of a circle of radius 5cm . T is a point such that $OT = 13\text{cm}$ and OT intersects the circle at E . If AB is the tangent to the circle at E , find length of AB .

A. 20 cm

B. $\frac{20}{3}\text{ cm}$

C. 10 cm

D. 25 cm

Answer: B



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32. In the figure, triangle ABC is isosceles in which $AB = AC = 6$ cm. If the radius of circle is 9 cm then what is the area of the triangle?

A. $8\sqrt{2}cm^2$

B. $8cm^2$

C. $2\sqrt{2}cm^2$

D. $\frac{8}{\sqrt{2}}cm^2$

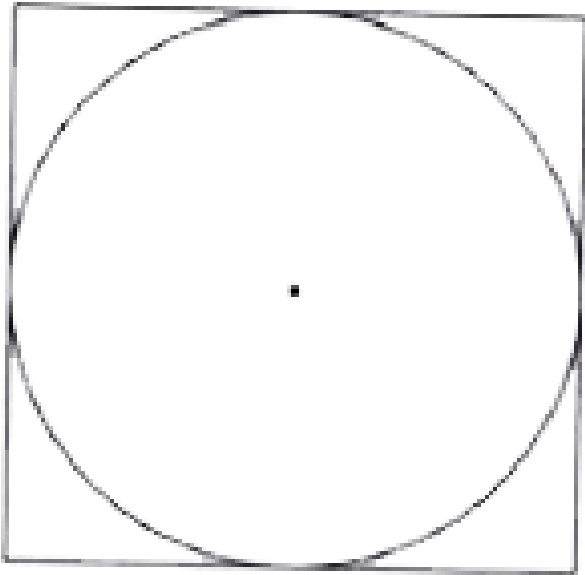
Answer: A



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Olympiad And Ntse Level Exercises

1. If the side of the square is 21 cm then the circumference of the circle in the figure is



A. 33 cm

B. 86 cm

C. 66 cm

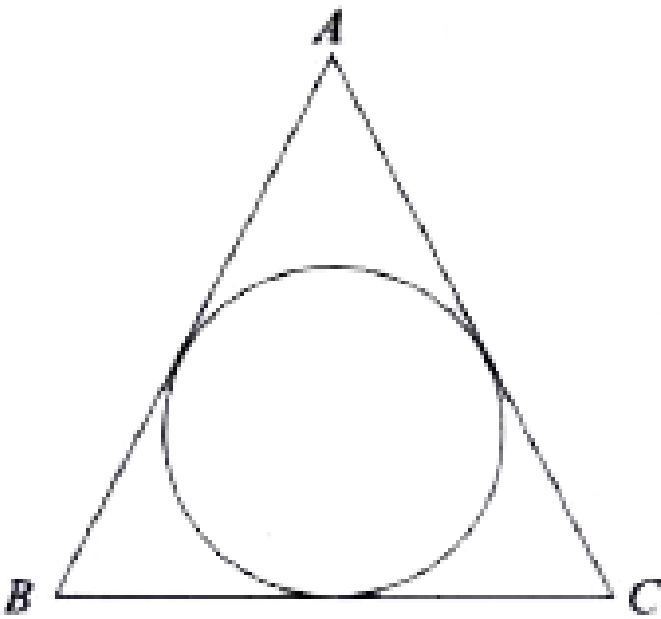
D. 132 cm

Answer: C



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2. ABC is an equilateral triangle of side x cm. The radius of its incircle is



A. $\frac{x}{\sqrt{3}} cm$

B. $\sqrt{3}x cm$

C. $\frac{2x}{\sqrt{3}} cm$

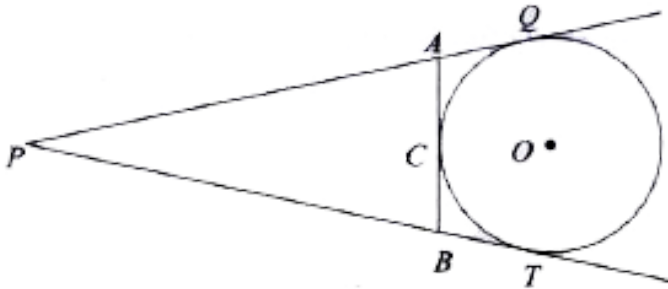
D. $\frac{x}{2\sqrt{3}} cm$

Answer: D



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3. In the figure , PQ and PT are tangents. AB is a third tangent touching the circle at C. If PQ = 35 cm , then the perimeter of $\triangle PAB$ is



- A. 70 cm
- B. $35\sqrt{2}$ cm
- C. $35\sqrt{3}$ cm
- D. 35 cm

Answer: A





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4. From a point A, the length of the tangent to a circle is 24 cm . And the distance of A from the centre is 25 cm . The radius of the circle is

A. 7 cm

B. 12 cm

C. 15 cm

D. 24.5 cm

Answer: A



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5. A tangent AB at a point A of a circle of radius 5 cm meets a line through the centre O at a point B so that $OB = 12$ cm ,
Length AB is

A. 10 cm

B. 12 cm

C. 9 cm

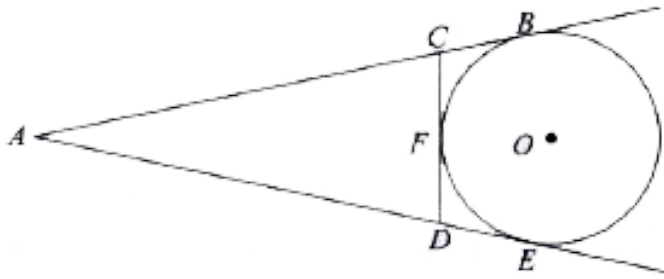
D. $\sqrt{119}$ cm

Answer: D



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6. In the figure , if AD, AE and BC are tangent to the circle at D,E and F , respectively , then

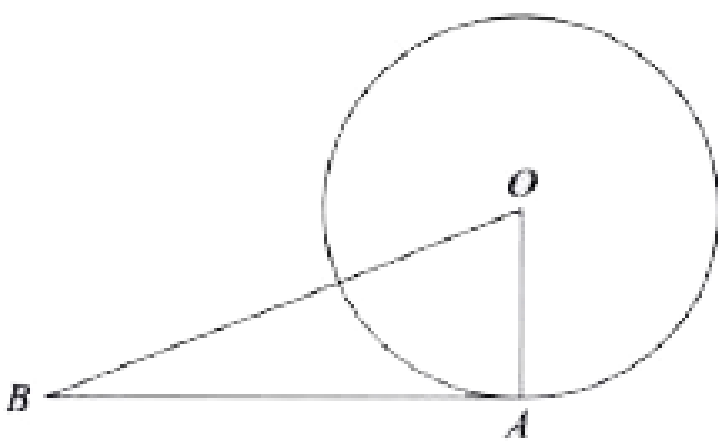


- A. $AD = AB + BC + CA$
- B. $2AD = AB + BC + CA$
- C. $\frac{AD}{2} = AB + BC + CA$
- D. $\frac{AD}{4} = AB + BC + CA$

Answer: B

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7. In the figure $OB = 12$ cm and $OB = 13$ cm . What is the area of the circle (in cm^2) ?



A. 36π

B. 25π

C. 5π

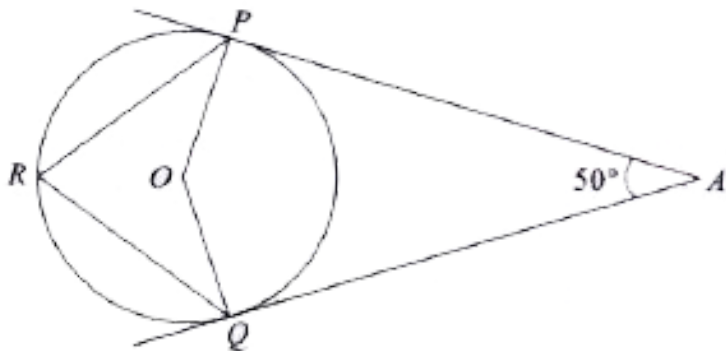
D. 50π

Answer: B



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8. In the given figure, O is the centre of the circle. AP and AQ are tangents to the circle. $\angle PRQ =$



A. 55°

B. 45°

C. 75°

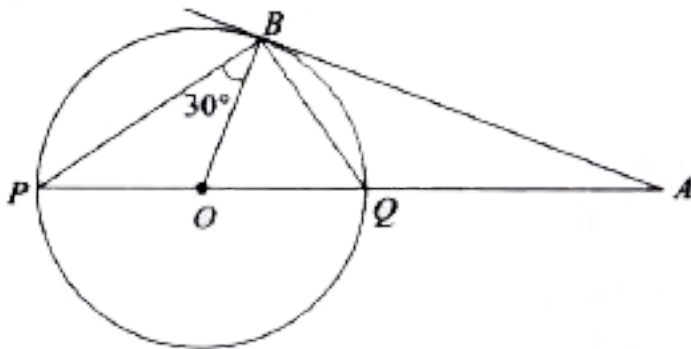
D. 65°

Answer: D



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9. In the given figure , AB is a tangent to the circle with centre O and $\angle BPQ = 40^\circ$. Find PQ : AQ.



A. 1 : 2

B. 1 : 3

C. 2 : 1

D. 3 : 1

Answer: C

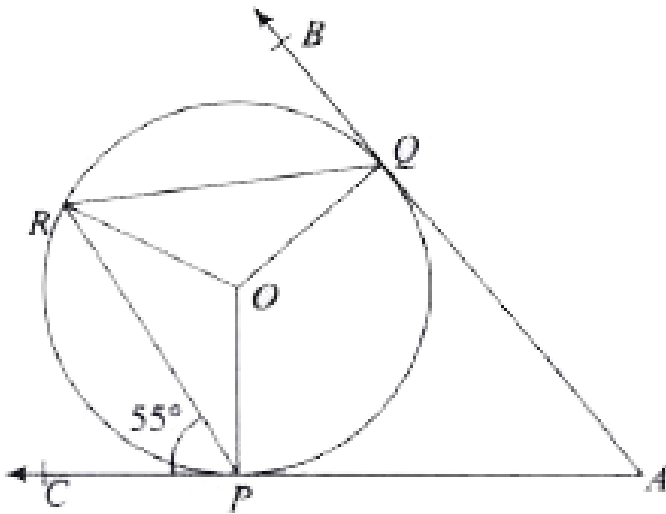


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10. In the given figure, O is the centre of the circle. AC and AB are the tangents to the circular at points P and Q , respectively.

Also

$\angle RPC = 55^\circ$ and $\angle RQB = 60^\circ$ then $\angle PRQ$ and $\angle QAP$ are, respectively .



A. 50°

B. 60°

C. 30°

D. 40°

Answer: A



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