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## Circle Questions for CGL Tier 1, CGL Tier 2, SSC 10 + 2, Railways Exam.

## Circle Quiz 8

Directions: Kindly study the following Questions carefully and choose the right answer:

1. $P Q$ is a chord of a circle with centre $O$ and SOR is a line segment originating from a point $S$ on the circle and intersecting PQ produced at $R$ such that $Q R=O S$. If $\angle Q R O=30^{\circ}$ then $\angle P O S$ = ?
A. $40^{\circ}$
B. $70^{\circ}$
C. $90^{\circ}$
D. $60^{\circ}$
2. $O$ and $O^{\prime}$ are respectively the orthocentre and circumcentre of an acute angled triangle PQR. the point $P$ and $O$ are joined and produced to meet the side $Q R$ at $S$. If $\angle P Q S=60^{\circ}$ and $\angle Q O ' R=130^{\circ}$ then $\angle R P S=$ ?

A. $45^{\circ}$
B. $35^{\circ}$
C. $60^{\circ}$
D. $75^{\circ}$
3. In the given figure below, $\angle A O B=48^{\circ}$ and $A C$ and $O B$ intersect each other at right angles. What is the measure of $\angle O B C$ ? ( $O$ is the centre of the circle)

A. $44^{\circ}$
B. $66^{\circ}$
C. $67^{\circ}$
D. $78.5^{\circ}$
4. In a right angled triangle, the circumcentre of the triangle lies.
A. inside the triangle
B. outside the triangle
C. on the midpoint of hypotenous
D. on one vertex
5. $A B$ is the diameter of a circle with centre $O$ and radius $O D$ is perpendicular to $A B$. Find the angle BAD
A. $60^{\circ}$
B. $45^{\circ}$
C. $30^{\circ}$
D. $75^{\circ}$
6. The radius of a wheel is 21 cm . How many revolutions will it make in travelling 924 meters? ( $\pi=22 / 7$ )
A. 7
B. 11
C. 200
D. 700
7. The length of the chord of a circle is 10 cm and perpendicular distance between the centre and the chord is 12 cm . then the radius of the circle is:
A. 15 cm
B. 13 cm
C. 18 cm
D. 21 cm
8. The distance between two parallel chords of length 10 cm each in a circle of diameter 26 cm is:
A. 12 cm
B. 24 cm
C. 32 cm
D. 38 cm
9. In given figure, $T$ point is 13 cm away from centre O and radius of circle is 5 cm . PT and QT are two tangents intersecting in $T$. Find the length of AB.

A. $\frac{19}{3} \mathrm{~cm}$.
B. $\frac{20}{3} \mathrm{~cm}$.
C. $\frac{40}{3} \mathrm{~cm}$.
D. $\frac{22}{3} \mathrm{~cm}$.
10. The radius of a circle is 5 cm . The distance of a point lying outside the circle from the centre is 13 cm : The length of the tangent drawn from the outside point to the circle is
A. 7 cm
B. 9 cm
C. 10 cm
D. 12 cm

## Correct Answers:

| $\mathbf{1}$ | $\mathbf{2}$ | $\mathbf{3}$ | $\mathbf{4}$ | $\mathbf{5}$ | $\mathbf{6}$ | $\mathbf{7}$ | $\mathbf{8}$ | $\mathbf{9}$ | $\mathbf{1 0}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| C | B | B | C | B | D | B | B | B | D |

## Explanations:

1. 



Let radius be ' $r$ ' and $\angle P O S=x^{\circ}$
$\triangle O Q R$ isosceles $\therefore \angle Q O R=30^{\circ}$
$\therefore \angle O Q R=120^{\circ}$ (Sum of all angles of $\triangle O Q R=180^{\circ}$ )
$\therefore \angle \mathrm{OQP}=60^{\circ}$ (Supplementary angle)
$\triangle O P Q$ isosceles since $O P=O Q=r$
$\therefore \angle O Q P=60^{\circ}=\angle O Q P$
$\therefore \angle \mathrm{POQ}=60^{\circ}=\left[\right.$ Sum of all angle of $\left.\Delta=180^{\circ}\right]$
Now SOR is a straight line
$\therefore \mathrm{x}+60^{\circ}+30^{\circ}=180^{\circ}$
$\therefore \mathrm{x}=90^{\circ}$

Hence, option (C) is correct.
2.

$\angle P Q S=60^{\circ}$
$\angle Q O^{\prime} R=130^{\circ}$
$\angle Q P R=\frac{1}{2} \times 130^{\circ}=65^{\circ}$
$\Rightarrow \angle Q R P=180^{\circ}-60^{\circ}-65^{\circ}=55^{\circ}$
$\Rightarrow \angle P O^{\prime} \mathrm{Q}=110^{\circ}$
In $\triangle$ QO'R
QO' = O'R
$\Rightarrow \angle O^{\prime} Q R=\angle O^{\prime} R Q=25^{\circ}$
$\because \angle O^{\prime} Q R+\angle O^{\prime} R Q=50^{\circ}$
$\Rightarrow \angle P Q O^{\prime}+\angle Q P O^{\prime}=35^{\circ}$
$\because \angle P Q O^{\prime}+\angle Q P O '=70^{\circ}$
Similarly, $\angle O^{\prime} P R=30^{\circ}$
$\therefore \angle \mathrm{RPS}=35^{\circ}$
Hence, option (B) is correct.
3. $\angle A O B=48^{\circ}$

So, $\angle A C B=\frac{1}{2} \angle A O B$
$=\frac{1}{2} \times 48^{\circ}=24^{\circ}$
(As angles made by same arc AB)
Given $A C$ and $O B$ intersect each other at right angle.
$\angle \mathrm{CQB}=90^{\circ}$
$\angle \mathrm{CBQ}=180^{\circ}-\left(90^{\circ}+24^{\circ}\right)=66^{\circ}$
so , $\angle \mathrm{OBC}=66^{\circ}$
Hence, option B is correct
4.

$\angle A P B=90^{\circ}$
$\mathrm{AB}=$ Diameter $=$ Hypotenous of triangle APB
$A s$, the angle of semicircle is right angle
so, the circumcentre lies on midpoint of hypoteneous
Hence, option (C) is correct.
5.


In $\triangle \mathrm{AOD}$ :
$O A=O D$ (radius)
$\angle A O D=90($ as $O D$ is perpendicular to $A B)$

So $\triangle$ AOD is isosceles having OA and OD sides equal and one angle as 90

So the remaining wo angles are 45 each
Hence $\angle B A D=45^{\circ}$

Therefore, option (B) is correct.
6. Circumference of wheel $=2 \pi r$
$=2 \times \frac{22}{7} \times 21 \mathrm{~cm}=132 \mathrm{~cm}$
$\therefore$ Number of revolutions $=\frac{92400 \mathrm{~cm}}{132 \mathrm{~cm}}=700$

Hence, option D is correct.

## 7.



Here, $A B$ is the chord of length 10 cm
i.e. $A B=10 \mathrm{~cm}$.

So, $\mathrm{AC}=\mathrm{CB}=\frac{10}{2}=5 \mathrm{~cm}$
$\Rightarrow A C=5 \mathrm{~cm}$
Here, AO is the required length as AO is the radius of the circle \& we know OC=12 cm
Applying Pythagoras theoram
$\Rightarrow A C^{2}+O C^{2}=A O^{2}$
$A O^{2}=(5)^{2}+(12)^{2}$
$A O^{2}=25+144$
$A O^{2}=169$
$A O=169$
$A O=13$
So, the radius of the circle is 13 cm
Hence, option B is correct.
8.

$\mathrm{OX}=$ Radius $=\frac{\text { Diameter }}{2}$

So, $O X=\frac{26}{2}=13 \mathrm{~cm}$
as, $X Z=10 \mathrm{~cm}$
$\therefore \mathrm{XY}=5 \mathrm{~cm}$

Now, we have to find OY

So, using pythagoras theorem
$O Y=\sqrt{O X^{2}-X Y^{2}}=\sqrt{(13)^{2}-(5)^{2}}$
$=\sqrt{169-25}=\sqrt{144}=12$
As OY $=12 \mathrm{~cm}$

So, OP = 12 cm
Hence, PY = Distance between the chords $=12 \times 2=24 \mathrm{~cm}$
Therefore, option B is correct.
9.

$\mathrm{OT}=13 \mathrm{~cm} ., \mathrm{OP}=5 \mathrm{~cm} \cdot \mathrm{PT}^{2}=\mathrm{OT}^{2}-\mathrm{OP}^{2} \mathrm{PT}^{2}=13^{2}-5^{2} \mathrm{PT}=12 \mathrm{~cm}$
In $\triangle$ TPO and $\triangle$ TEA,
$\angle \mathrm{PTO} \cong \angle \mathrm{ETA}$ (same angles)
$\angle O P T \cong \angle T E A$ (right angles)
By AA criterion, $\triangle$ TPO $\sim \Delta$ TEA
$\frac{T P}{T E}=\frac{P O}{E A}$
$\frac{12}{8}=\frac{5}{E A}$
$E A=\frac{10}{3}$
$A B=2 E A=\frac{20}{3}$

Hence, option (B) is correct.
10. Tangent and radius are perpendicular to each other. They form a right angled triangle with radius and the length of the tangent as arms of right angle and the 13 cm line from centre to the point lying outside as hypotenuse.
$\therefore(\text { The length of the tangent })^{2}+(\text { radius })^{2}=13^{2}$
$(\text { The length of the tangent })^{2}=13^{2}-5^{2}=144$
$\Rightarrow$ The length of the tangent $=12 \mathrm{~cm}$

Hence, option (D) is correct.


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