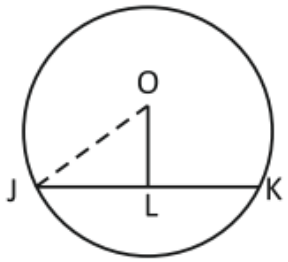
MBA PRO 2024

QUANTITATIVE APTITUDE

DPP: 06

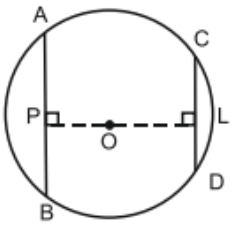
Circles 2

Q1 In a circle with center O, JK is a chord of length $16\ \text{cm}$. The perpendicular distance between the centre and chord is $6\ \text{cm}$, then find the radius of the circle.



(A) $8\ \text{cm}$
(B) $6\ \text{cm}$
(C) $10\ \text{cm}$
(D) $12\ \text{cm}$

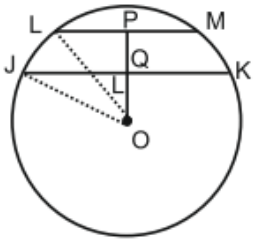
Q2



In a circle, $\text{AP} = \sqrt{111}\ \text{cm}, \text{CD} = 16\ \text{cm}, \text{OL} = 15\ \text{cm}$, find the sum of OP and OL.

(A) $(17 + \sqrt{178})\text{cm}$
(B) $(17 + \sqrt{111})\text{cm}$
(C) $(15 + \sqrt{111})\text{cm}$
(D) $(15 + \sqrt{178})\text{cm}$

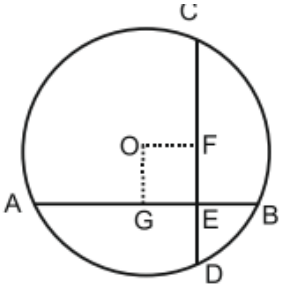
Q3 In a cicle, JK is a chord of length $30\ \text{cm}$ and LM of length $16\ \text{cm}$. Find the distance between two chords if the radius of the circle is $17\ \text{cm}$.



(A) $15\ \text{cm}$
(B) $8\ \text{cm}$
(C) $7\ \text{cm}$
(D) $23\ \text{cm}$

Q4 In a circle, two parallel chords are dawn of diameter $74\ \text{m}$. The length of one of the chord is $40\sqrt{3}\ \text{m}$ and the distance between the two chords is $25\ \text{m}$. Find the length of another parallel chord (in m)

Q5 In a circle, two chords AB and CD are perpendicular and intersect each other at point E as shown in the figure. If $\text{OG} = \text{EF}, \text{OF} = 16\ \text{cm}$ and $\text{AB} = 112\ \text{cm}$, then find ED in cm if radius is $65\ \text{cm}$.



(A) $33\ \text{cm}$
(B) $30\ \text{cm}$
(C) $63\ \text{cm}$
(D) $126\ \text{cm}$

Q6 Ram draw two equal circles of radius $12\ \text{cm}$ which intersect each other in such a way that each passes through the centre of the other. The length of the common chord is :

(A) $12\sqrt{3}\ \text{cm}$
(B) $14\sqrt{3}\ \text{cm}$
(C) $6\sqrt{3}\ \text{cm}$
(D) $(12+6\sqrt{3})\text{cm}$

Q7 Rajesh draw the largest chord of a circle which is equal to $22.48\ \text{cm}$. Which of the following is true regarding the radius of circle.

(A) radius is equal to $11\ \text{cm}$
(B) radius is greater than $11\ \text{cm}$
(C) radius is less than $11\ \text{cm}$
(D) radius is greater than or equal to $11\ \text{cm}$

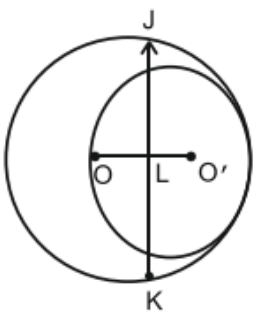
Q8 Rahul draw two unequal circle in such a way that they intersect each other at two point. The length of the common chord of these two intersecting circles is $48\ \text{cm}$ and the radius of two circle be $25\ \text{cm}$ and $26\ \text{cm}$. What is the distance between their centre?

(A) $17\ \text{cm}$
(B) $10\ \text{cm}$
(C) $7\ \text{cm}$
(D) $3\ \text{cm}$

Q9 Ashwani draw two equal circles which intersect at A and B. A straight line through A meets the circle at J and K then which of the following statement is true :

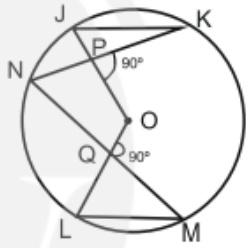
(A) $\angle\text{BJA} = \angle\text{BKA}$
(B) $\text{BJ} = \text{BK}$
(C) Both (a) and (b)
(D) None of these

Q10 Raghav draw a figure in which two circle with centre as O and O' of $9\ \text{cm}$ and $7\ \text{cm}$ touch each other internally. Find the length of JK, if JK is act as perpendicular bisector of OO'.



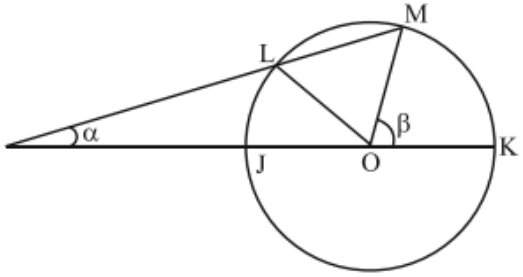
(A) $4\sqrt{5}\ \text{cm}$
(B) $2\sqrt{5}\ \text{cm}$
(C) $8\sqrt{5}\ \text{cm}$
(D) $8\ \text{cm}$

Q11 The following figure is dawn by Sudheer in which O is the center of the circle. Sudheer draw two equal chord NK and NM where $\text{OQ} \perp \text{NM}$ and $\text{OP} \perp \text{NK}$. If $LM = 6\sqrt{3}\ \text{cm}$ then find the sum of LM and JK.



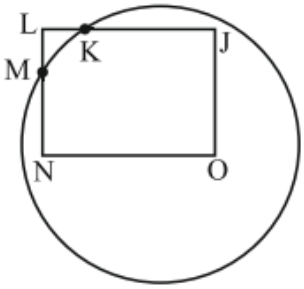
(A) $12\sqrt{3}\ \text{cm}$
(B) $\sqrt{3}\ \text{cm}$
(C) $6\ \text{cm}$
(D) $3\sqrt{3}\ \text{cm}$

Q12 In the following figure, O is the center, LM is a chord of a circle. LM is extended to N such that $\text{OL} = \text{LN}$ and NJ is joined and meet at K. where JK is the diameter of the circle. Find the relation between α and β.



(A) $\beta = 3\alpha$
(B) $\beta = \alpha$
(C) $\beta = 2\alpha$
(D) $\beta = \alpha/2$

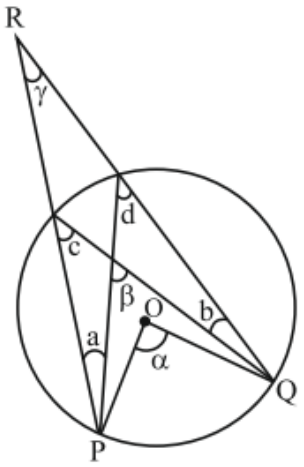
Q13 In the following figure, OJLN is a square. Barsha draw a circle with centre O which cuts the square at K and M. Which of the following statement is true.



(A) $\mathrm{OK} = \mathrm{OM}$
(B) $\mathrm{LK} = \mathrm{LM}$
(C) $\mathrm{JK} = \mathrm{MN}$
(D) All of these

Q14 Aakash draw a pair of concentric circle of radius 9.5 cm and $7\,\mathrm{cm}$. Find the length of chord of outer circle which touches the inner circle externally without intersecting.
(A) $6.42\ \mathrm{cm}$
(B) $12.84\ \mathrm{cm}$
(C) $3.21\ \mathrm{cm}$
(D) $18.42\ \mathrm{cm}$

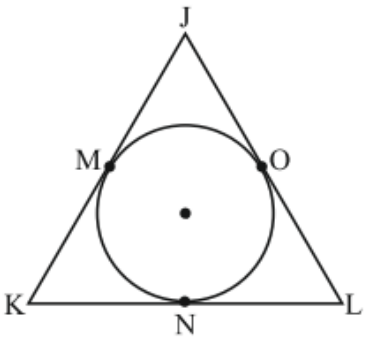
Q15 In the following figurer, O is the centre of the circle. Find the relation between α, β, γ.



(A) $\alpha = \beta + \gamma$
(B) $\alpha + \beta - \gamma = 0$
(C) $\alpha - \beta + \gamma = 0$
(D) $\alpha = \beta = \gamma$

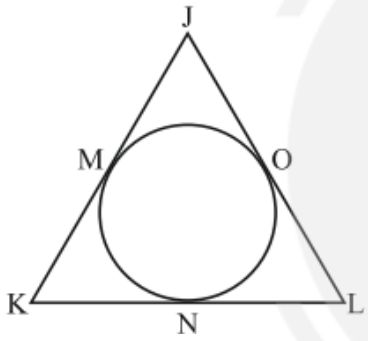
Q16 Ankur draw a special type of concentric circle in which the difference of radius of two concentric circle is $4\ \mathrm{cm}$ and if these two circle touches each other externally then the distance between their centre is $13\ \mathrm{cm}$. Find the radius of bigger circle.
(A) $4\ \mathrm{cm}$
(B) $8.5\ \mathrm{cm}$
(C) $4.5\ \mathrm{cm}$
(D) $4.2\ \mathrm{cm}$

Q17 In the adjoining figure, a circle is inscribed in a triangle JKL, touches the circle at point M, N and O respectively. If JK, KL and JL are 9,10 and 11 respectively. Find the sum of JM, KM and OL.



(A) $10\ \text{cm}$
(B) $12\ \text{cm}$
(C) $14\ \text{cm}$
(D) $15\ \text{cm}$

Q18 In the adjoining figure, a circle is inscribed in a $\triangle JKL$ touching the side at M, N and O respectively. If $JK = 9\ \text{cm}, KN = 4.5\ \text{cm}$ and $OL = 6\ \text{cm}$. Find the perimeter of $\triangle JKL$.

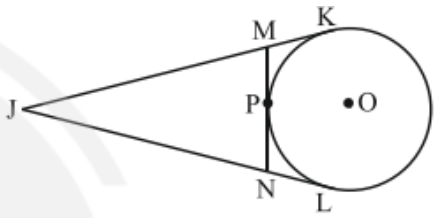


(A) $30\ \text{cm}$
(B) $21\ \text{cm}$
(C) $19.5\ \text{cm}$
(D) $35\ \text{cm}$

Q19 Rakesh draw three concentric circle in such a way that the ratio of radii of these three circle is $9 : 10 : 11$. What will be the ratio of area between the two inner circle to that of between the two outer circle.
(A) $3 : 2$
(B) $19 : 21$
(C) $17 : 19$
(D) $17 : 21$

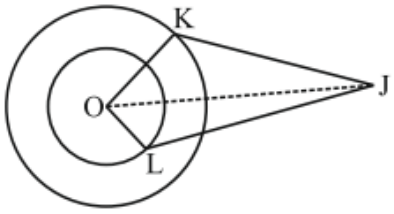
Q20 Rakesh draw there concentric circle of radii a, 12, 7. If the area enclosed by circle of radii a and 12 is same as the area enclosed by circle of radii 12 and 7. Find the value of a approx, if $a > 12 > 7$.
(A) $15.4\ \text{cm}$
(B) $16\ \text{cm}$
(C) $18\ \text{cm}$
(D) $11\ \text{cm}$

Q21 In the adjoining figure, JK and JL are tangent drawn to circle with centre O. If MN is an another tangent at point P. Find the perimeter of $\triangle JMN$ if $JK = 18\ \text{cm}$.



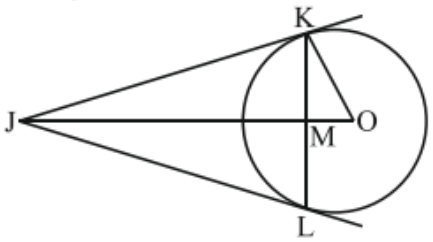
(A) $18\ \text{cm}$
(B) $36\ \text{cm}$
(C) $54\ \text{cm}$
(D) $27\ \text{cm}$

Q22 In the adjoining figure O is centre of the two concentric circle of radii $8\ \text{cm}$ and $11\ \text{cm}$ respectively. JK and JL are tangent to the outer and inner circle respectively. If $JK = 15\ \text{cm}$ then find the length of JL (approximately).



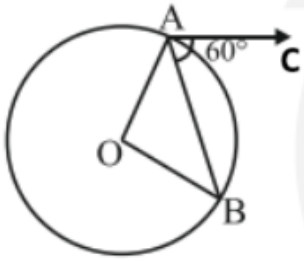
(A) $16.8\ \text{cm}$
(B) $16\ \text{cm}$
(C) $14\ \text{cm}$
(D) $18\ \text{cm}$

Q23 In the adjoining figure, JK and JL are tangent to a circle of centre O. If the length of chord KL is 12 cm and the radius of the circle is $10\ \mathrm{cm}$ then find the length of JK.



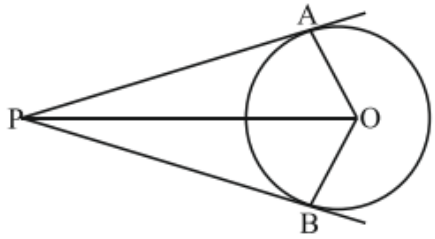
(A) $7.5\ \mathrm{cm}$
(B) $8\ \mathrm{cm}$
(C) $9\ \mathrm{cm}$
(D) $4.5\ \mathrm{cm}$

Q24 In the given figure, O is the centre of circle and AC is the tangent of the circle. If AB is a chord such that $\angle \mathrm{BAC} = 60^\circ$ then $\angle \mathrm{AOB} = ?$



(A) 120°
(B) 130°
(C) 125°
(D) 135°

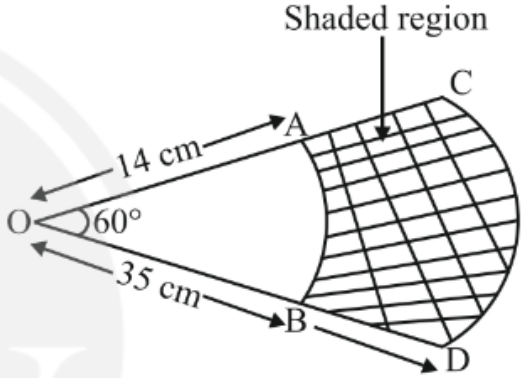
Q25 In the adjoining figure, PA and PB are two tangent to a circle with center O such that $\angle \mathrm{APB} = 77^\circ$, then the value of $\angle AOP$ will be



(A) 52.5°
(B) 51.5°
(C) 53.5°
(D) 50.5°

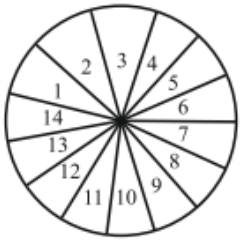
Q26 Rahul own a car which has three wipers which do not overlap each other. The length of each wiper is $15\ \mathrm{cm}$ sweeping through an angle of $60^\circ, 70^\circ, 50^\circ$. Find the total area cleaned at each sweep of wipers approximately.
(A) $350\ \mathrm{cm}^2$
(B) $353.57\ \mathrm{cm}^2$
(C) $360\ \mathrm{cm}^2$
(D) $356\ \mathrm{cm}^2$

Q27 Find the area of the shaded region.



(A) $540\ \mathrm{cm}^2$
(B) $538\ \mathrm{cm}^2$
(C) $539\ \mathrm{cm}^2$
(D) $539.5\ \mathrm{cm}^2$

Q28 Ashwani draw a design for his company which contain a circle. He divided this circle into 14 equal parts. Find the sum of the area of part 4, 5, 6, 11, 12,13 .

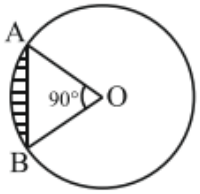


(A) $\frac{7\pi r^2}{14}$
(B) $\left(\frac{3\pi r^2}{7}\right)$

(C) $\left(\frac{3\pi r^2}{14}\right)$

(D) $\left(\frac{3\pi r^2}{16}\right)$

Q29 Find the area of the segment if the radius of the circle is $4.9\ \text{m}$ and central angle is 90°.



(A) $6.86\ \text{cm}^2$

(B) $5.76\ \text{cm}^2$

(C) $6.76\ \text{cm}^2$

(D) $7.86\ \text{cm}^2$

Q30 Sugandha make a Japanese fan made up of clothes which is fixed between the metallic wire. When Sugandha opens the fan then the central angle between the two metallic wire become 140°. If the total area of the fan is $44\ \text{cm}^2$ then find the length of each metallic wire (in cm)

(A) 5 (B) 6

(C) 7 (D) 8

Answer Key

Q1	(C)
Q2	(D)
Q3	(C)
Q4	70
Q5	(B)
Q6	(A)
Q7	(B)
Q8	(A)
Q9	(C)
Q10	(C)
Q11	(A)
Q12	(A)
Q13	(D)
Q14	(B)
Q15	(A)
Q16	(B)
Q17	(D)
Q18	(A)
Q19	(B)
Q20	(A)
Q21	(B)
Q22	(A)
Q23	(A)
Q24	(A)
Q25	(B)
Q26	(B)
Q27	(C)
Q28	(B)
Q29	(A)
Q30	(B)

Hints & Solutions

Q1 Text Solution:

In Δ OJL.

$$\begin{aligned}
OJ^2 &= OL^2 + JL^2 \\
OJ^2 &= (6)^2 + (8)^2 \\
OJ^2 &= 36 + 64 \\
OJ^2 &= 100 \\
OJ &= 10 \text{ cm}
\end{aligned}$$

Q2 Text Solution:

in $\triangle$OCL,

$$\begin{aligned}
OC^2 &= OL^2 + CL^2 \\
OC^2 &= (15)^2 + (8)^2 \\
OC^2 &= 225 + 64 = 289 \\
OC &= 17\text{Cm}
\end{aligned}$$

in $\triangle$OPA

$$\begin{aligned}
OA^2 &= OP^2 + PA^2 \\
289 &= OP^2 + (\sqrt{111})^2 \\
OP &= \sqrt{178} \text{ cm} \\
OP + OL & \\
&= \sqrt{178} + 15 \\
&= 15 + \sqrt{178}
\end{aligned}$$

Q3 Text Solution:

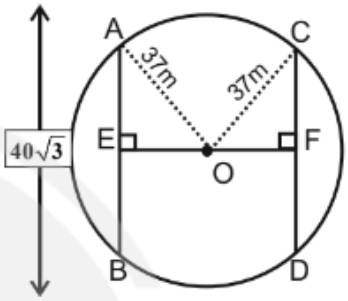
Here OJ and OL are radius of circle in $\triangle$OJQ

$$\begin{aligned}
OJ^2 &= OQ^2 + QJ^2 \\
(17)^2 &= OQ^2 + (15)^2 \\
OQ^2 &= 64 \\
OQ &= 8 \text{ cm}
\end{aligned}$$

in $\triangle$OPL,

$$\begin{aligned}
OL^2 &= OP^2 + PL^2 \\
(17)^2 &= OP^2 + (8)^2 \\
OP^2 &= 225 \\
OP &= 15 \text{ cm} \\
PQ &= OP - OQ \\
&= 15 - 8 \\
&= 7 \text{ cm}
\end{aligned}$$

Q4 Text Solution:



Here, AE $= \frac{40\sqrt{3}}{2} = 20\sqrt{3}$ m

in $\triangle$AEO

$$\begin{aligned}
OA^2 &= AE^2 + EO^2 \\
(37)^2 &= (20\sqrt{3})^2 + EO^2 \\
1369 &= 1200 + EO^2 \\
EO^2 &= 1369 - 1200 = 169 \\
EO^2 &= 13 \text{ m} \\
EF &= 25 \text{ m} = 12 \text{ m} \\
OF &= 25 - 13 = 12 \text{ m} \\
FC &= OC^2 - OF^2 \\
&(37)^2 - (12)^2 \\
FC &= 35 \text{ m} \\
CD &= 2 \times FC = 70 \text{ m}
\end{aligned}$$

Q5 Text Solution:

$$AG = \frac{AB}{2} = \frac{112}{2} = 56 \text{ cm}$$

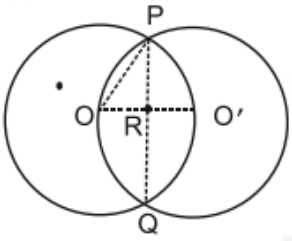
in $\triangle$OAG

$$OA^2 = OG^2 + AG^2$$
$$(65)^2 = OG^2 + (56)^2$$
$$OG^2 = 1089$$
$$OG^2 = 33 \text{ cm}$$

in $\triangle OCF$

$$OC^2 = OF^2 + FC^2$$
$$(65)^2 = (16)^2 + (FC)^2$$
$$FC = 3969$$
$$FC = 63$$
$$CF = FD = 63 \text{ cm}$$
$$OG = FE = 33 \text{ cm}.$$
$$ED = FD - FE$$
$$\Rightarrow 63 \text{ cm} - 33 \text{ cm}$$
$$FD = 30 \text{ cm}$$

Q6 Text Solution:



$OP = 12\text{cm}$ then

$$OR = \frac{OO'}{2} = \frac{12}{2} = 6\text{cm}$$

in ΔPRO,

$$OP^2 = PR^2 + OR^2$$
$$\Rightarrow 144 = 36 = PR^2$$
$$\Rightarrow PR^2 = 108$$
$$\Rightarrow PR = 6\sqrt{3} \text{ cm}.$$
$$PQ = 6\sqrt{3} \times 2 = 12\sqrt{3} \text{ cm}$$

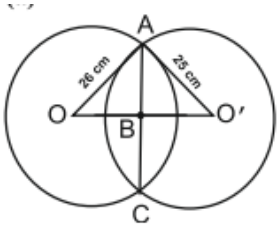
Q7 Text Solution:

As we know that the largest Chord of a circle is the diameter of the circle.

$$\text{Radius} = \frac{22.48}{2} = (11.24)$$

Hence, option (b) is the correct choice

Q8 Text Solution:



$$AC = 48 \text{ cm}$$
$$AB = \frac{48}{2} = 24 \text{ cm}$$

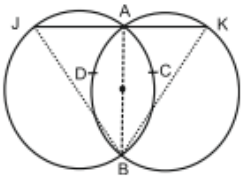
in $\triangle OAB$,

$$OB^2 = OA^2 - AB^2$$
$$= (26)^2 - (24)^2$$
$$OB = 10 \text{ cm}$$

in $\triangle ABO'$

$$O'B^2 = O'A^2 - AB^2$$
$$= (25)^2 - (24)^2$$
$$O'B^2 \Rightarrow 49$$
$$O'B = 7 \text{ cm}$$
$$OO' = 10 + 7$$
$$17 \text{ cm}$$

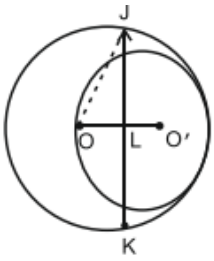
Q9 Text Solution:



Dotted lines are considered as construction Here we can see that AB is common chord Arc $ACB = \text{arc } ADB$ So, $\angle BJA = \angle BKA$ and

$BJ = BK$ ..(1) Hence option (c) will be the correct choice.

Q10 Text Solution:



Let JK bisect OO' at L.

$$OL = \frac{OO'}{2}$$
$$OO' = 9 - 7 = 2 \text{ cm}$$
$$OL = \frac{2}{2} = 1 \text{ cm}$$

OJ is the radius of bigger circle equal to 9 cm
In $\triangle OJL$,

$$OJ^2 = OL^2 + JL^2$$
$$(9)^2 = (1)^2 + JL^2$$
$$JL^2 = 81 - 1$$
$$JL^2 = 80(16 \times 5)$$
$$JL = 4\sqrt{5} \text{ cm}$$
$$JK = 2 \times JL = 2 \times 4\sqrt{5}$$
$$JK = 8\sqrt{5} \text{ cm}$$

Q11 Text Solution:

It is given that $NM = NK$.
One can say that $\frac{NM}{2} = \frac{NK}{2}$
Now, $OQ \perp NM$ and $OP \perp NK$ so one can - Say that,

$$NQ = QM \text{ and } NP = PK$$

By equation (1) and (2) one can say that

$$PK = QM$$

One knows that equal chords are equidistant form the centre

$$OP = OQ$$
$$OL = OJ \text{ (radius)}$$
$$OL - OQ = OJ - OP$$
$$QL = PJ \rightarrow (6)$$
$$\triangle OLM \cong \triangle PPK$$
$$QL = PJ$$
$$PK = QM$$
$$\angle JPK = \angle LQM$$

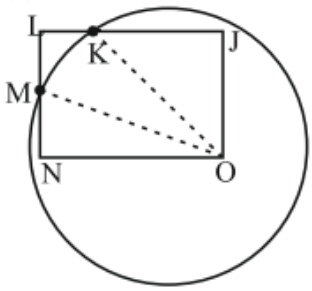
(SAS)
So, $LM = JK = 6\sqrt{3}$ cm
Therefore the required sum will be 12√3 cm

Q12 Text Solution:

Here, $OL = LN$
So $\angle LNO = \angle LON = \alpha$
By exterior Angle property,

$$\angle MLO = \alpha + \alpha = 2\alpha$$
$$OL = OM = \text{ radius},$$
$$\angle OLM = \angle OML = 2\alpha$$
$$\text{in } \Delta ONM$$
$$\angle ONM + \angle OMN = \angle MOK$$
$$\alpha + 2\alpha = \beta$$
$$\beta = 3\alpha$$

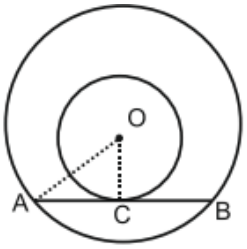
Q13 Text Solution:



in $\triangle OJK$ and $\triangle ONM$
$OJ = ON$ (side of a square)

$\angle OJK = \angle ONM\ (90^\circ \text{ each})$
$OK = OM = \text{radius}$
By SAS criteria
$\Delta OJK \cong \Delta ONM$
$JK = MN$ (By C.P.C.T)
$JL - JK = LN - NM$
$LK = LM$ (By C.P.C.T)
(3)

Q14 Text Solution:



$$OA = 9.5\ \text{cm}$$
$$OC = 7\ \text{cm}$$

in $\triangle OAC$

$$OA^2 = OC^2 + AC^2$$
$$(9.5)^2 = (7)^2 + (AC)^2$$
$$(AC)^2 = 41.25$$
$$AC = 6.42\ \text{cm}$$
$$AB = 2 \times AC$$
$$= 2 \times 6.42$$
$$= 12.84\ \text{cm}$$

Q15 Text Solution:

We have

$$\angle c = \angle d$$

(Angle on the same segment)
Also, $\angle \alpha = 2 \times \angle c$

$$\angle \alpha = \angle c + \angle c \Rightarrow \angle \alpha = \angle c + \angle d$$

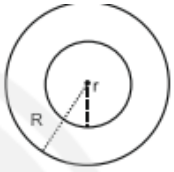
But $\angle \beta = \angle a + \angle c$
(By exterior angle property)

$$\angle c = \angle \beta - \angle a$$

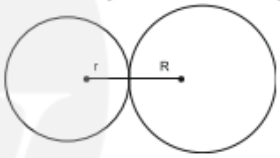
By eq. (1) and (2) we get

$$\angle \alpha = \angle \beta - \angle a + \angle d$$
$$\angle \alpha = \angle \beta - \angle a + \angle \gamma + \angle a$$
$$\angle \alpha = \angle \beta + \angle \gamma$$

Q16 Text Solution:



As per the question,
$R - r = 4$ cm
And if they touch externally



then

$$R + r = 13$$

on Solving these two equations we get,

$$R = 8.5\ \text{cm}$$
$$r = 4.5\ \text{cm}.$$

Q17 Text Solution:

Here, JK, KL and JL act as a tangent
Let, $JM = JO = a$
$KM = KN = b$
$OL = NL = c$
$a + b = 9\ \text{cm}$
$b + c = 10$

$c + a = 11$

adding all we get

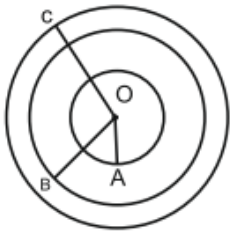
$$2(a+b+c) = 30$$
$$a+b+c = 15 \text{ cm}$$
$$a = 5 \text{ cm}$$
$$b = 4 \text{ cm}$$
$$c = 6 \text{ cm}$$
$$JM + KM + OL$$
$$= 5 + 4 + 6$$
$$= 15 \text{ cm}.$$

Q18 Text Solution:

Here, JK, KL and JL are tangent.

$$\text{JK} = 9 \text{ cm}, \quad \text{KN} = \text{Km} = 4.5 \text{ cm}$$
$$\text{OL} = \text{NL} = 6 \text{ cm}$$
$$\text{KN} + \text{NL} = \text{KL}$$
$$4.5 + 6 = \text{KL}$$
$$\text{KL} = 10.5 \text{ cm}$$
$$\text{JM} = \text{JO} = 9 - 4.5 = 4.5 \text{ cm}.$$
$$\text{JL} = \text{JO} + \text{OL} = 4.5 \text{ cm} + 6 \text{ cm}$$
$$\text{JL} = 10.5 \text{ cm}$$
$$\text{Required Perimeter} = 10.5 + 10.5 + 9$$
$$= 30 \text{ cm}.$$

Q19 Text Solution:



$$\text{OC} = 11\text{x}$$

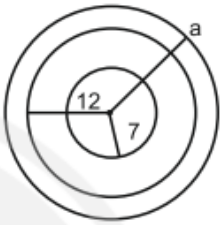
Area between the inner two circles

$$\Rightarrow \pi\left((10x)^2 - (9x)^2\right)$$
$$= \pi \times \left(19x^2\right)$$
$$= 19\pi x^2$$

Area between the outer two circles

$$= \pi\left((11x)^2 - (10x)^2\right)$$
$$= \pi\left(121x^2 - 100x^2\right)$$
$$= 21\pi x^2$$
$$\text{Required ratio}$$
$$= 19\pi x^2 : 21\pi x^2$$
$$19 : 21$$

Q20 Text Solution:



As per the question,

$$\pi\left((a)^2 - (12)^2\right) = \pi\left((1)^2 - (7)^2\right)$$
$$a^2 - 144 = 144 - 49$$
$$a^2 = 144 - 49 + 144$$
$$a^2 = 239$$
$$a = 15.4 \text{ cm}$$

Q21 Text Solution:

$$\text{Here, JK} = \text{JL}$$
$$\text{MK} = \text{MP},$$
$$\text{NP} = \text{NL}$$
$$\text{Now perimeter of } \triangle\text{JMN}$$
$$= (\text{JM} + \text{MN} + \text{JN}).$$
$$D \Rightarrow (\text{JK} - \text{MK}) + (\text{MP} + \text{PN})$$
$$+ (\text{JL} - \text{NL})$$
$$\Rightarrow \text{JK} - \text{MK} + \text{MP} + \text{PN} + \text{JL} - \text{NL}$$
$$\Rightarrow \text{JK} + \text{JL}$$
$$\Rightarrow 18 + 18$$
$$= 36 \text{ cm}$$

Q22 Text Solution:

We know that radius is $\perp$ to tangent.

$$\angle OKJ = 90^\circ$$

in ΔOKJ

$$(KJ)^2 + (OK)^2 = (OJ)^2$$

in $\triangle OJL$

$$(OL)^2 + (JL)^2 = (OJ)^2$$
$$(15)^2 + (11)^2 = (8)^2 + (JL)^2$$
$$225 + 121 = 64 + (JL)^2$$
$$(JL)^2 = 282$$
$$(JL) = 16.79 \approx 16.8 \text{ cm}$$

Q23 **Text Solution:**

Let $JK = a$

and $JM = b$

$OM \perp KL$ it means $KM = \frac{12}{2} = 6$ cm

In $\triangle OKM$

$$OM^2 = OK^2 - KM^2$$
$$OM^2 = (10)^2 - (6)^2 = 64$$
$$OM = 8 \text{ cm}$$

Now in $\triangle JKM$,

$$JK^2 = (JM)^2 + (MK)^2$$
$$a^2 = b^2 + (6)^2$$

in $\triangle JKO$

$$JO^2 = JK^2 + OK^2$$
$$JO^2 = a^2 + (10)^2$$
$$(b+8)^2 = b^2 + (6)^2 + (10)^2$$
$$b^2 + 8^2 + 2 \times b \times 8 = b^2 + 36 + 100$$
$$64 + 16b = 136$$
$$16b = 136 - 64$$
$$16b = 72$$
$$b = 4.5 \text{ m}$$
$$a^2 = b^2 + (6)^2$$
$$a^2 = 56.25$$
$$a = 7.5 \text{ cm}$$

Q24 **Text Solution:**

$OA \perp AC$

$$\angle OAB = 90 - 60 = 30^\circ$$

$OA = OB$ So $\angle OAB = \angle OBA = 30^\circ$

in $\triangle AOB$

$$\angle AOB + \angle OAB + \angle DBA = 180^\circ$$
$$\angle AOB + 30 + 30^\circ = 180$$
$$\angle AOB = 120^\circ$$

Q25 **Text Solution:**

$$\angle APO = \frac{1}{2} \times \angle APB = \frac{77}{2}$$

$OA \perp PA$ Then, in $\triangle APO$, $\angle APO + \angle OAP + \angle AOP = 180^\circ$

$\Rightarrow \frac{77}{2} + 90 + \angle AOP = 180^\circ$

$\Rightarrow \angle AOP = 51.5^\circ$

Q26 **Text Solution:**

While sweeping, these wipers form a sector.

Area of sector $= \pi r^2 \frac{\theta}{360}$

Area covered by these three wipers,

$$\Rightarrow \pi r^2 \left(\frac{60^\circ}{360} + \frac{70^0}{360} + \frac{50^0}{360}\right)$$
$$= \pi r^2 \frac{180}{360}$$
$$\Rightarrow \frac{22}{7} \times 15 \times 15 \times \frac{1}{2}$$
$$= 353.57 \text{ cm}^2$$

Q27 Text Solution:

radius of bigger circle $(R) = 35$ cm

radius of small circle $(r) = 14$ cm

shaded region $= (\pi R^2 \frac{\theta}{360} - \pi r^2 \frac{\theta}{360})$

$\Rightarrow \pi \times \frac{\theta}{360}\left[R^2 - r^2\right]$

$= \frac{22}{7} \times \frac{60}{360} \times \left[(35)^2 - (14)^2\right]$

$\frac{22}{7} \times \frac{1}{6} \times [(1225 - 196]$

539 cm^2

Q28 Text Solution:

Let the radius of the circle is r total area $= \pi r^2$.

Area of each region $= \left(\frac{\pi r^2}{14}\right)$

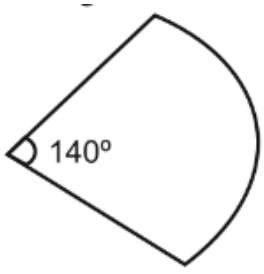
as the area of such region is equal, then the required sum is,

$$\Rightarrow \frac{\pi r^2}{14} + \frac{\pi r^2}{14} + \frac{\pi r^2}{14} + \frac{\pi r^2}{14} + \frac{\pi r^2}{14} + \frac{\pi r^2}{14}$$
$$= \frac{6\pi r^2}{14} = \frac{3\pi r^2}{7}$$

Q29 Text Solution:

$$\Rightarrow \frac{\pi r^2 \theta}{360} - \frac{1}{2} \times a \times b \times \sin\theta$$
$$= \frac{22}{7} \times 4.9 \times 4.9 \times \frac{90}{360} - \frac{1}{2} \times 4.9 \times 4.9 \times \sin 90^\circ$$
$$= 18.865 - 12.005$$
$$= 6.86 \text{ cm}^2$$

Q30 Text Solution:



Area of sector $= \frac{\pi r^2 \theta}{360}$

$44 \text{ cm}^2 = \frac{22}{7} \times r \times r \times \frac{140}{360}$

$44 \times \frac{7}{22} \times \frac{360}{140} = r^2$

$r^2 = 36$

$r = \pm 6$

$r = +6$ is only possibility