AREAS RELATED TO CIRCLES

MCQs & A and R WORK SHEET

Test / Exam Name: Mcq 01 **Standard: 10th** **Subject: Mathematics**

Student Name: ..... **Section:** ..... **Roll No.:** .....

Questions: 47 **Time: 01:00 hh:mm** **Negative Marks: 0** **Marks: 47**

Instructions

1. MULTIPLE CHOICE QUESTIONS.

Q1. The area of the sector of angle 60º of a circle with radius 10cm is: **1 Mark**

A $52\frac{2}{21}\text{cm}^2$ **B** $52\frac{8}{21}\text{cm}^2$ **C** $52\frac{4}{21}\text{cm}^2$ **D** None of these

Ans: B $52\frac{8}{21}\text{cm}^2$

Solution:

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

$\frac{60^\circ}{360^\circ} \times \frac{22}{7} \times 10 \times 10$

$= \frac{1100}{21} = 52\frac{8}{21}\text{sq.cm}$

Q2. The circumference of a circle whose diameter is 4.2cm is: **1 Mark**

A 13.2cm **B** 4.2cm **C** 11cm **D** 22cm

Ans: A 13.2cm

Solution:

Given: Diameter (d) = 4.2cm

∴ Circumference=\pi\text{d}=\frac{22}{7}\times4.2=13.2\text{cm}

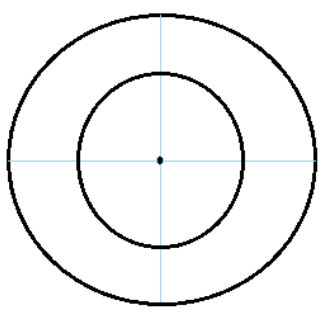
Q3. Two concentric circles intersect at _____ number of points: **1 Mark**

A 2 **B** 0 **C** 1 **D** None of these

Ans: B 0

Solution:

Two concentric circles do not intersect. They only share a common centre as shown in the figure.



Q4. The circumference of a circle is 22cm. The area of its quadrant (in cm^2) is: **1 Mark**

A \frac{77}{2} **B** \frac{77}{4} **C** \frac{77}{8} **D** \frac{77}{16}

Ans: C \frac{77}{8}

Solution:

Circumference of the circle =2\pi\text{r}

\Rightarrow\text{R}=\frac{22\times7}{44}

\Rightarrow\text{R}=\frac{7}{2}

Area of quadrant =\frac{1}{4}\pi\text{r}^2

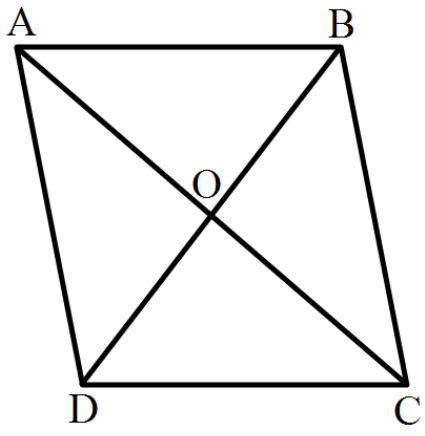
\Rightarrow\frac{1}{4}\times\frac{22}{7}\times\frac{7}{2}\times\frac{7}{2}=\frac{77}{8}

Q5. One side of a rhombus is 20cm long and one of its diagonals measure 24cm. The area of the rhombus is: **1 Mark**

A 192cm^2 **B** 480cm^2 **C** 240cm^2 **D** 384cm^2.

Ans: D 384cm^2.

Solution:



We have,

AB = BC = CD = DA = 20cm and BD = 24cm

Also, \text{BO}=\frac{\text{BD}}{2}=\frac{24}{2}=12\text{cm}

In \triangle\text{AOB},

Using Pythagoras theorem

\text{AO}^2=\text{AB}^2-\text{BO}^2

=20^2-12^2

=400-144

\Rightarrow\text{AO}^2=256

\Rightarrow\text{AO}=\sqrt{256}

\Rightarrow\text{AO}=16\text{cm}

\Rightarrow\text{AC}=2\text{AO}=2\times16=32\text{cm}

Now, the area of the rhombus ABCD =\frac{1}{2}\times\text{AC}\times\text{BD}

=\frac{1}{2}\times32\times24

=384\text{cm}^2

Q6. To draw a pair of tangents to a circle which are inclined to each other at an angle of 45º, it is required to draw tangents at the endpoints of the two radii of the circle, which are inclined at an angle of: **1 Mark**

A 105º **B** 135º **C** 130º **D** 125º

Ans: B 135º

Solution:

According to the question, the angle between radii is 180º - 45º = 135º.

Q7. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre the length of the arc is 22 cm: **1 Mark**

A True **B** False **C** Neither **D** Either

Ans: A True

Solution:

Arc length \frac{\theta}{360}\times2\pi\text{r}=\frac{60}{360}\times2\times\frac{22}{7}\times21=22\text{cm}.

Q8. Fixed point in the circle is called _____ of the circle: **1 Mark**

A Radius **B** Centre **C** Diameter **D** None

Ans: B Centre

Solution:

A circle is the set of all those point in a plane whose distance from a fixed point remains constant.

Then, this fixed point is called the centre of the circle.

Q9. If the sum of the areas of two circles with radii r_1 and r_2 is equal to the area of a circle of radius r, then: **1 Mark**

A \text{r}=\text{r}_1+\text{r}_2 **B** \text{r}^2_1+\text{r}^2_2=\text{r}^2 **C** \text{r}_1=\text{r}_2<\text{r}

D \text{r}^2_1+\text{r}^2_2<\text{r}^2

Ans: B \text{r}^2_1+\text{r}^2_2=\text{r}^2

Solution:

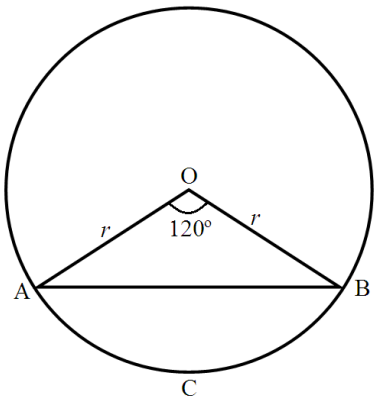
According to the given condition,

Area of circle = Area of first circle + Area of second circle.

\therefore\pi\text{r}^2=\pi\text{r}^2_1+\pi\text{r}^2_2

\Rightarrow\text{r}^2=\text{r}^2_1+\text{r}^2_2\text{(b)}

Q10. In the following figure, the area of segment ACB is: **1 Mark**



A \Big(\frac{\pi}{3}-\frac{\sqrt{3}}{2}\Big)\text{r}^2 **B** \Big(\frac{\pi}{3}+\frac{\sqrt{3}}{2}\Big)\text{r}^2

C \Big(\frac{\pi}{3}-\frac{\sqrt{2}}{3}\Big)\text{r}^2 **D** \text{None of these}

Ans: D \text{None of these}

Solution:

We have to find area of segment ACB.

Area of the ACB segment =\Big(\frac{\pi\theta}{360}-\sin\frac{\theta}{2}\cos\frac{\theta}{2}\Big)\text{r}^2

We know that \theta=120^\circ.

Substituting the values we get,

Area of the ACB segment =\Big(\frac{\pi\times120}{360}-\sin60\cos60\Big)\text{r}^2

\therefore Area of the PAQ segment =\Big(\frac{\pi}{3}-\sin60\cos60\Big)\text{r}^2

Substituting \sin60=\frac{\sqrt{3}}{2} and \cos60=\frac{1}{2} we get,

Area of the ACB segment =\Big(\frac{\pi}{3}-\frac{\sqrt{3}}{2}\times\frac{1}{2}\Big)\text{r}^2

\therefore Area of the ACB segment =\Big(\frac{\pi}{3}-\frac{\sqrt{3}}{4}\Big)\text{r}^2

Therefore, area of the segment ACB is \Big(\frac{\pi}{3}-\frac{\sqrt{3}}{4}\Big)\text{r}^2

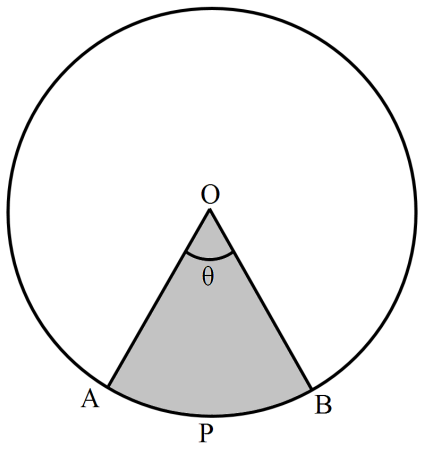
Hence, the correct answer is option (d).

Q11. The part of the circular region enclosed by two radii and the corresponding arc of a circle is called: **1 Mark**

A A segment **B** A radius **C** A sector **D** A chord

Ans: C A sector

Solution:



The part of the circular region enclosed by two radii and the corresponding arc of a circle is called a sector.

Q12. If the circumference of a circle increases from 4\pi to 8\pi, then its area is: **1 Mark**

A Halved. **B** Halved. **C** Tripled. **D** Quadrupled.

Ans: D Quadrupled.

Solution:

Let the circumference \text{C}=4\pi

\therefore2\pi\text{r}=4\pi

\therefore\text{r}=2

Therefore, area of the circle when radius of the circle is 2 can be calculated as below,

\pi\text{r}^2=\frac{22}{7}\times4\ \dots(1)

Now when circumference is \text{C}=8\pi, then the radius of the circle is calculated as below,

\therefore2\pi\text{r}=8\pi

\therefore\text{r}=4

Therefore, area of the circle when radius of the circle is 4 can be calculated as below,

\pi\text{r}^2=\frac{22}{7}\times16

\therefore\pi\text{r}^2=4\Big(\frac{22}{7}\times4\Big) \dots(2)

Therefore, from equation (1) and (2) we can say that its area is quadrupled.

Hence, the correct answer is option (d).

Q13. The area of a circle is 2464 sq.cm, then its diameter is given by: **1 Mark**

A 28cm **B** 7cm **C** 56cm **D** 14cm

Ans: C 56cm

Solution:

Given: Area of circle = 2464 sq.cm

$\Rightarrow\pi\text{r}^2=2464$

$\Rightarrow\text{r}^2=\frac{2464}{22}\times 7=784$

$\Rightarrow\text{r}=28\text{cm}$

$\therefore$ Diameter = 2×× radius = 2 ×× 28 = 56cm

Q14. Area of a sector of angle p (in degrees) of a circle with radius R is: **1 Mark**

A $\frac{\text{p}}{720}\times2\pi\text{R}^2$ **B** $\frac{\text{p}}{180}\times2\pi\text{R}$

C $\frac{\text{p}}{360}\times2\pi\text{R}$ **D** $\frac{\text{p}}{180}\times\pi\text{R}^2$

Ans: A $\frac{\text{p}}{720}\times2\pi\text{R}^2$

Solution:

Area of the sector of angle p of a circle with radius R

$=\frac{\theta}{360}\times\pi\text{r}^2=\frac{\text{p}}{360}\times\pi\text{R}^2$

$=\frac{\text{p}}{2(360)}\times2\pi\text{R}^2=\frac{\text{p}}{720}\times2\pi\text{R}^2$

Q15. If the difference between the circumference and the radius of a circle is 37 cm, then using $\pi = \frac{22}{7}$, the circumference (in cm) of the circle is: **1 Mark**

A 154 **B** 14 **C** 44 **D** 7

Ans: B 14

2. 14

Circumference of the circle $2\times\text{pi}\times\text{r}=\frac{2\times22}{7\times\text{r}}=\frac{44\times\text{r}}{7}$

Where r = radius

Now,

Given difference = 37

$\frac{44\times\text{r}}{7-\text{r}}=37$

$\text{f}\Big\{\big(\frac{44}{7}\big)\Big\}=37$

$\text{r}\big(\frac{37}{7}\big)=37\text{cm}$

$\text{r}=7$

Circumference of the circle = 2 × pi × r

$=2\times\big(\frac{22}{7}\big)\times7$

$=44\text{cm}$

Q16. If the radius of a circle is diminished by 10%, then its area is diminished by: **1 Mark**

A 10% **B** 19% **C** 20% **D** 36%

Ans: B 19%

Solution:

Let in first case radius of a circle = r

Then area $=\pi\text{r}^2$

In second case, radius $=\frac{\text{r}\times(100-10)}{100}$

$=\frac{\text{r}\times90}{100}=\frac{9}{10}\text{r}$

Then area $=\pi\Big(\frac{9}{10\text{r}}\Big)^2=\frac{81}{100}\pi\text{r}^2$

Difference $=\pi\text{r}^2-\frac{81}{100}\pi\text{r}^2=\frac{100-81}{100}\pi\text{r}^2$

$=\frac{19}{100}\pi\text{r}^2$

$\therefore$ It is diminished by 19% (b)

Q17. The radius of a wheel is 0.25m. How many revolutions will it make in covering 11km? **1 Mark**

A 4000 **B** 2800 **C** 5500 **D** 7000

Ans: D 7000

Solution:

Distance covered in 1 revolulion $=2\pi\text{r}$

$=\Big(2\times\frac{22}{7}\times0.25\Big)\text{m}$

$=\Big(2\times\frac{22}{7}\times\frac{25}{100}\Big)\text{m}$

$=\frac{11}{7}\text{m}$

Number of revolutions taken to cover 11km $=\Big(11\times1000\times\frac{7}{11}\Big)$

$=7000$

Q18. If the difference between the circumference and radius of a circle is 37cm, then using $\pi=\frac{22}{7}$ the circumference (in cm) of the circle is: **1 Mark**

A 154 **B** 44 **C** 14 **D** 7

Ans: B 44

Solution:

We know that circumference; C of the circle with radius r is equal to $2\pi\text{r}$

We have given difference between circumference and radius of the citcle that is 37cm,

$\therefore\text{C}-\text{r}=2\pi\text{r}-\text{r}$

$\therefore(2\pi-1)\text{r}=37$

Substituting we $\pi=\frac{22}{7}$ get,

$\therefore\Big(2\times\frac{22}{7}-1\Big)\text{r}=37$

$\therefore\Big(\frac{44-7}{7}\Big)\text{r}=37$

$\therefore\Big(\frac{37}{7}\Big)\text{r}=37$

Dividing both sides of the equation by $\frac{7}{37}$, we get, $\therefore\text{r}=7$

Threfore, circumference of the circle will be

$2\pi\text{r}=2\times\frac{22}{7}\times7$

$=44\text{cm}^2$

Hence, the correct choice is (b).

Q19. The perimeter of a circular field is 242m. The area of the field is: **1 Mark**

A 9317m^2 **B** 18634m^2 **C** 4658.5m^2 **D** None of these

Ans: C 4658.5m^2

Solution:

Let the radius be r cm.

We know,

Cirumference of the circle $=2\pi\text{r}$

Thus, we have:

$2\pi\text{r}^2=242$

$\Rightarrow2\times\frac{22}{7}\times\text{r}=242$

$\Rightarrow\frac{44}{7}\times\text{r}=242$

$\Rightarrow\text{r}=\Big(242\times\frac{7}{44}\Big)$

$\Rightarrow\text{r}=\frac{77}{2}$

$\therefore$ Area of the circle $=\pi\text{r}^2$

$=\Big(\frac{22}{7}\times\frac{77}{2}\times\frac{77}{2}\Big)\text{m}^2$

$=4658.5\text{m}^2$

Q20. If π is taken as $\frac{22}{7}$, the distance (in metres) covered by a wheel of diameter 35cm, in onerevolution, is: **1 Mark**

A 2.2 **B** 1.1 **C** 9.625 **D** 96.25

Ans: B 1.1

Solution:

Diameter of a wheel = 35cm $=\frac{35}{100}\text{m}$

Circumference of the wheel πd

$=\frac{35}{100}\times\frac{22}{7}$

$=\frac{110}{100}=1.10=1.1\text{m}$

$\therefore$ Distance in one revolution = 1.1m (b)

Q21. The area of an equilateral triangle is $4\sqrt3\text{cm}^2$. Its perimeter is: **1 Mark**

A 9cm **B** 12cm **C** $12\sqrt3\text{cm}$ **D** $6\sqrt3\text{cm}$

Ans: B 12cm

Solution:

Area of an equilateral triangle $=\frac{\sqrt3}{4}\text{a}^2$ (where a is the length of the side)

Thus, we have:

$4\sqrt3=\frac{\sqrt3}{4}\text{a}^2$

$\Rightarrow\text{a}^2=16$

$\Rightarrow\text{a}=4\text{cm}$

Perimeter of the equilateral triangle = 3a = 3 × 4 = 12cm.

Q22. The sides of a triangle are in the ratio 12 : 14 : 25 and its perimeter is 25.5cm. The largest side of the triangle is: **1 Mark**

A 7cm **B** 14cm **C** 12.5cm **D** 18cm.

Ans: C 12.5cm

Solution:

The sides of a triangle are in the ratio 12 : 14 : 25.

Let the common multiple be x cm.

? The sides of the triangle are 12x, 14x and 25x

Now,

Perimeter = 12x + 14x + 25x

? 25 .5 = 51x

? x = 0.5

? The sides of the triangle are 12 × 0.5 = 6cm, 14 × 0.5 = 7cm and 25 × 0.5 = 12.5cm

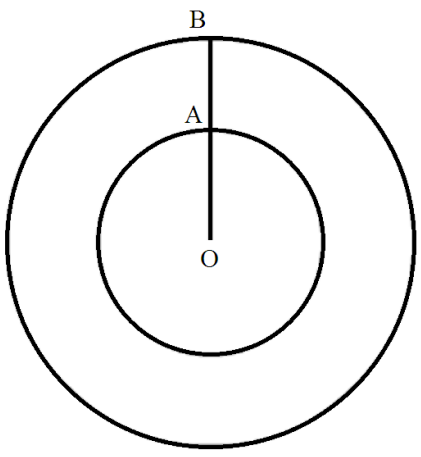
? The largest side of the triangle is 12.5cm.

Q23. The area of a circular path of uniform width h surrounding a circular region of radius r is: **1 Mark**

A $\pi(2\text{r}+\text{h})\text{r}$ **B** $\pi(2\text{r}+\text{h})\text{h}$ **C** $\pi(\text{h}+\text{r})\text{r}$ **D** $\pi(\text{h}+\text{r})\text{h}$

Ans: B $\pi(2\text{r}+\text{h})\text{h}$

Solution:



We have

OA = r

AB = h

Therefore, radius of the outer circle will be r + h

Now we will find the area between the two circles.

Area of the circular path - area of the outer circle - area of the inner cicrle.

$\therefore$ Area of the circular path $=\pi\Big[(\text{r}+\text{h})^2\Big]-\pi\text{r}^2$

$\therefore$ Area of the circular path $=\pi(\text{r}^2+2\text{rh}+\text{h}^2)-\pi\text{r}^2$

$\therefore$ Area of the circular path $=\pi(\text{r}^2+2\text{rh}+\text{h}^2-\text{r}^2)$

Cancelling r^2 we get,

Area of the circular path $=\pi(2\text{rh}+\text{h}^2)$

$\therefore$ Area of the circular path $=\pi(2\text{r}+\text{h})\text{h}$.

Hence, the correct answer is option (b).

Q24. The circumference of a sector of angle 60^o of a circle with radius 10cm is: **1 Mark**

A $\frac{200}{21}\text{cm}$ **B** $\frac{20}{21}\text{cm}$ **C** $\frac{220}{21}\text{cm}$ **D** None of these

Ans: C $\frac{220}{21}\text{cm}$

Solution:

Circumference of sector = $\text{l}=\frac{\theta}{360^\circ}\times2\pi\text{r}$

$\Rightarrow\text{l}=\frac{60^\circ}{360^\circ}\times2\times\frac{22}{7}\times10$

$=\frac{220}{21}\text{cm}$

Q25. The angle described by the hour hand in 2 hours is: **1 Mark**

A 60^o **B** 360^o **C** 90^o **D** 30^o

Ans: A 60^o

Solution:

$\because$ Angle described by the hour hand in 12 hours = 360^o

$\therefore$ Angle described by the hour hand in 2 hours $=\frac{360^\circ}{12}\times2=60^\circ$

Q26. The circumferences of two circles are in the ratio 3 : 4. The ratio of their areas is: **1 Mark**

A 3 : 4 **B** 4 : 3 **C** 9 : 16 **D** 16 : 9

Ans: C 9 : 16

Solution:

Let the the radii of the two circles be r and R, the circumferences of the circles be c and C and the areas of the two circles be a and A.

Now,

$\frac{\text{c}}{\text{C}}=\frac{3}{4}$

$\Rightarrow\frac{2\pi\text{r}}{2\pi\text{R}}=\frac{3}{4}$

$\Rightarrow\frac{\text{r}}{\text{R}}=\frac{3}{4}$

Now, the ratio between their areas is given by

$\frac{\text{a}}{\text{A}}=\frac{\pi\text{r}^2}{\pi\text{R}^2}$

$=\Big(\frac{\text{r}}{\text{R}}\Big)^2$

$=\Big(\frac{3}{4}\Big)^2$

$=\frac{9}{16}$

Hence, the correct answer is option (c).

Q27. Each side of an equilateral triangle is $6\sqrt3\text{cm}$. The altitude of the triangle is: **1 Mark**

A 8cm **B** 9cm **C** $3\sqrt3\text{cm}$ **D** 6cm.

Ans: B 9cm

Solution:

As, area of an equilateral triangle $=\frac{\sqrt3}{4}\times(\text{side})^2$

$\Rightarrow\frac{1}{2}\times\text{Base}\times\text{Height}=\frac{\sqrt3}{4}\times(6\sqrt3)^2$

$\Rightarrow\frac{1}{2}\times6\sqrt3\times\text{Height}=\frac{\sqrt3}{4}\times36\times3$

$\Rightarrow3\sqrt3\times\text{Height}=27\sqrt3$

$\Rightarrow\text{Height}=\frac{27\sqrt3}{3\sqrt3}$

$\therefore\ \text{Height}=9\text{cm}$

Q28. If the difference between the circumference and radius of a circle is 37cm, then its area is: **1 Mark**

A 154cm^2 **B** 160cm^2 **C** 200cm^2 **D** 150cm^2

Ans: A 154cm^2

Solution:

Let r be the radius of a circle then circum-ference $=2\pi\text{r}$

$\therefore2\pi\text{ r}-\text{r}=37$

$\text{r}\Big(2\times\frac{22}{7}-1\Big)=37\Rightarrow\text{r}\Big(\frac{44}{7}-7\Big)=37$

$\Rightarrow\text{r}\Big(\frac{37}{7}\Big)=37\Rightarrow\text{r}=\frac{37\times7}{37}=7\text{cm}$

Now area of the circle $=\pi\text{r}^2$

$=\frac{22}{7}\times7\times7=154\text{cm}^2\text{(a)}$

Q29. The area of a sector whose perimeter is four times its radius r units, is: **1 Mark**

A $\frac{\text{r}^2}{4}\text{sq. units}$ **B** $2\text{r}^2\text{sq. units}$ **C** $\text{r}^2\text{sq. units}$

D $\frac{\text{r}^2}{2}\text{sq. units}$

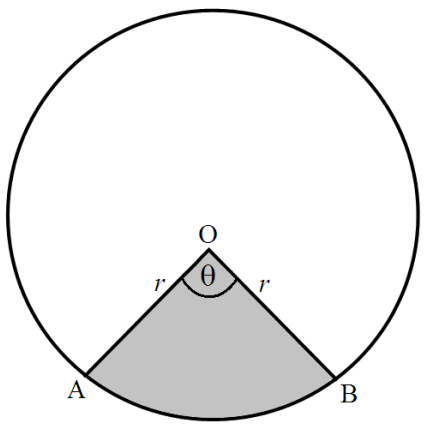
Ans: C $\text{r}^2\text{sq. units}$

Solution:

Radius of sector = r

Perimeter = 4r

and length of arc = 4r – 2r = 2r



$\therefore$ Let angle at the centre $=\theta$

Then, $2\pi\text{r}=\frac{\theta}{360^\circ}=2\text{r}$

$\Rightarrow\pi=\frac{\theta}{360^\circ}=1\ \dots\text{(i)}$

Now area $\pi\text{r}^2\times\frac{\theta}{360^\circ}=\text{r}^2\Big(\pi\times\frac{\theta}{360^\circ}\Big)$

$=\text{r}^2\times1$ [From (i)]

$=\text{r}^2\text{(c)}$

Q30. The areas of two circles are in the ratio 9 : 4. The ratio of their circumferences is: **1 Mark**

A 3 : 2 **B** 4 : 9 **C** 2 : 3 **D** 81 : 16

Ans: A 3 : 2

Solution:

Let the the radii of the two circles be r and R, the circumferences of the circles be c and C and the areas of the two circles be a and A.

Now,

$\frac{\text{a}}{\text{A}}=\frac{9}{4}$

$\Rightarrow\frac{\pi\text{r}^2}{\pi\text{R}^2}=\Big(\frac{3}{2}\Big)^2$
$\Rightarrow\frac{\text{r}}{\text{R}}=\frac{3}{2}$
Now, the ratio between their circumferences is given by
$\frac{\text{c}}{\text{C}}=\frac{2\pi\text{r}}{2\pi\text{R}}$
$=\frac{\text{r}}{\text{R}}$
$=\frac{3}{2}$
Hence, the correct answer is option (a)

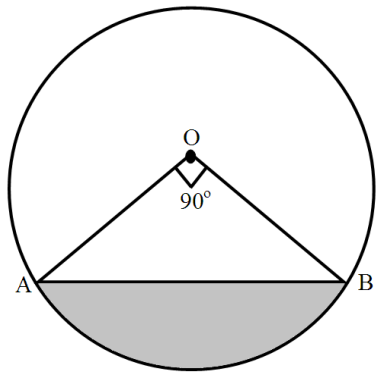
Q31. On increasing the diameter of a circle by 40%, its area will be increased by: **1 Mark**

A 40% **B** 80% **C** 96% **D** 82%

Ans: C 96%

Solution:
Let d the original diameter.
Radius $=\frac{\text{d}}{2}$
Thus, we have:
Original area $=\pi\times\Big(\frac{\text{d}}{2}\Big)^2$
$=\frac{\pi\text{d}^2}{4}$
New diameter =140% of d
$=\Big(\frac{140}{100}\times\text{d}\Big)$
$=\frac{7\text{d}}{5}$
Now,
New radius $=\frac{7\text{d}}{5\times2}$
$=\frac{7\text{d}}{10}$
New area $=\pi\times\Big(\frac{7\text{d}}{10}\Big)^2$
$=\frac{49\pi\text{d}^2}{10}$
Increase in the area $=\Big(\frac{49\pi\text{d}^2}{10}-\frac{\pi\text{d}^2}{4}\Big)$
$=\frac{24\pi\text{a}^2}{100}$
$=\frac{6\pi\text{a}^2}{25}$
We have:
Increase in the area $=\Big(\frac{6\pi\text{a}^2}{25}\times\frac{4}{\pi\text{a}^2}\times100\Big)\%$
$=96\%$

Q32. In the following figure, the shaded area is: **1 Mark**



A $50(\pi-2)\text{cm}^2$ **B** $25(\pi-2)\text{cm}^2$ **C** $25(\pi+2)\text{cm}^2$ **D** $5(\pi-2)\text{cm}^2$

Ans: B $25(\pi-2)\text{cm}^2$

Solution:
Area of the shaded region is-
$=\Big[\frac{\pi\theta}{360}-\sin\frac{\theta}{2}\cos\frac{\theta}{2}\Big](\text{r})^2$
$=\Big(\frac{\pi}{4}-\frac{1}{2}\Big)(10)^2$
$=25(\pi-2)\text{cm}^2$
So the answer is (b).

Q33. If the radius of the circle is $7\sqrt{\pi\text{ cm}}$, then its area is: **1 Mark**

A 98 sq. cm **B** 49 sq. cm **C** 45 sq. cm **D** 22 sq. cm

Ans: B 49 sq. cm

Solution:
Area of the circle $=\pi\text{r}^2$
? Area of the circle $=\pi\Big(\frac{7}{\sqrt{\pi}}\Big)^2=\pi\times\frac{49}{\pi}=49\text{ sq.cm}$

Q34. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is: **1 Mark**

A 22 : 7 **B** 14 : 11 **C** 7 : 22 **D** 11 : 14

Ans: B 14 : 11

Solution:

Let radius of circle be r and side of a square be a

According to the given condition,

Perimeter of a circle = Perimeter of a square

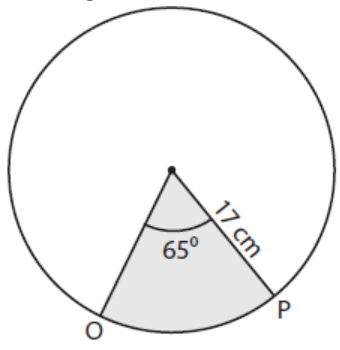
$\therefore 2\pi r = 4a \Rightarrow a = \frac{\pi r}{2} \dots (i)$

Now, $\frac{\text{Area of circle}}{\text{Area of square}} = \frac{\pi r^2}{a^2} = \frac{\pi r^2}{\left(\frac{\pi r}{2}\right)^2}$

[From Eq. (i)]

$= \frac{\pi r^2}{\frac{\pi^2 r^2}{4}} = \frac{4}{\pi} = \frac{4}{\frac{22}{7}} = \frac{28}{22} = \frac{14}{11}$

Q35. The length of the arc OP is: **1 Mark**



A 16.28cm **B** 12.28cm **C** 15.28cm **D** 19.28cm

Ans: D 19.28cm

Solution:

Arc length

Q36. What is the area of a quadrant of a circle with radius 'r' units? **1 Mark**

A πr^2 **B** $\pi r^2 / 4$ **C** $\pi r^2 / 2$ **D** $2 \pi r^2$

Ans: A quadrant is a sector with central angle 90^0. So it has area equal to one-fourth that of the circle.

Q37. Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as: **1 Mark**

Assertion: The diameter of a wheel is 4.2m. It makes 75 revolutions in one minute. The speed of the wheel is 59, $\frac{\text{km}}{\text{h}}$

Reason: Distance travelled in one minute = Circumference ×Number of revolutions in one minute.

A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false. **D** Assertion (A) is false but reason (R) is true.

Ans: A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Solution:

We have, diameter of wheel = 4.2m

Circumference of circle = one revolution

$= \pi \times 4.2 = \frac{22}{7} \times 4.2 = 13.2$

Distance covered in 75 revolutions

$= (75 \times 13.2)\text{m}$

$\text{Speed wheel} = \frac{\text{Distance travelled}}{\text{Time taken}}$

$= \left(\frac{75 \times 13.2}{\frac{1}{60}} \times \frac{1}{1000}\right)\frac{\text{km}}{\text{h}}$

$= 75 \times 13.2 \times 60 = 59.4\frac{\text{ km}}{\text{h}}$

Q38. Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as: **1 Mark**

Assertion (A): In a circle of radius 6cm, the angle of a sector is 60°. Then the area of the sector is $\frac{132}{7}\text{cm}^2$

Reason (R): Area of the circle with radius r is πr^2

A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false. **D** Assertion (A) is false but reason (R) is true.

Ans: B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

2. Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

Q39. Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as: **1 Mark**

Assertion: If a wire of length 22cm is bent is the shape of a circle, then area of the circle so formed is 40cm.
Reason: Circumference of the circle = length of the wire.

A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false.

D Assertion (A) is false but reason (R) is true.

Ans: D Assertion (A) is false but reason (R) is true.

Solution:

$2\pi\text{r}=22$

$\text{r}=3.5\text{cm}$

$\therefore$ Area of the circle $=\frac{22}{7}\times3.5\times3.5=38.5\text{cm}^2$

Q40. Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). **1 Mark**

Mark the correct choice as:

Assertion (A): A bicycle wheel makes 5000 revolutions in covering 11km. Then diameter of the wheel is 35cm.

Reason (R): Arca of segment of a circle is $\frac{\theta}{360}\times\pi\text{r}^2-\frac{1}{2}\text{r}^2\sin\theta$.

A BothA and R are true and R is the correct explanation for A.

B Both A and R are true and R is not the correct explanation for A.

C A is true but Ri s false.

D A is false but R is true.

Ans: D A is false but R is true.

4. A is false but R is true.

Q41. Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). **1 Mark**

(R).Mark the correct choice as:

Assertion: If the circumference of a circle is 176cm, then its radius is 28cm.

Reason: Circumference $=2\pi\times\text{radious}$

A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false.

D Assertion (A) is false but reason (R) is true.

Ans: A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Solution:

Required length $=\bigg|\frac{(3\hat{\text{i}}-\hat{\text{j}}-2\hat{\text{k}}).(\hat{\text{i}}+2\hat{\text{j}}-3\hat{\text{k}})}{\sqrt{1^2+2^2+(-3)^2}}\bigg|$

$\frac{3-2+6}{\sqrt{1+4+9}}=\frac{7}{\sqrt{14}}$

Q42. Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). **1 Mark**

(R).Mark the correct choice as:

Assertion: If the circumference of two circles are in the ratio 2 : 3, then ratio of their areas is 4 : 9.

Reason: The circumference of a circle of radius r is $2\pi\text{r}$ and its area is πr^2

A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false.

D Assertion (A) is false but reason (R) is true.

Ans: A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Solution:

Given, $\frac{2\pi\text{r}_1}{2\pi\text{r}_2}=\frac{2}{3}$

$\Rightarrow\frac{\text{r}_1}{\text{r}_2}=\frac{2}{3}$

Now, ratio of their area will be

$\frac{\pi\text{r}^2_1}{\pi\text{r}^2_2}=\big(\frac{\text{r}_1}{\text{r}_2}\big)^2=\big(\frac{2}{3}\big)^2=\frac{4}{9}$

Q43. Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). **1 Mark**

Mark the correct choice as:

Assertion (A): The length of the minute hand of a clock is 7 cm. Then the area swept by the minute hand in 5 minutes is $12\frac{5}{6}\text{cm}^2$.

Reason (R): 'Lhe length of an arc of a sector of angle \theta and radius 7 is given by \text{l}=\frac{\theta}{360}\times2\pi\text{r}.

A BothA and R are true and R is the correct explanation for A.

B Both A and R are true and R is not the correct explanation for A.

C A is true but Ri s false.

D A is false but R is true.

Ans: B Both A and R are true and R is not the correct explanation for A.

2. Both A and R are true and R is not the correct explanation for A.

Q44.Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). **1 Mark**

Mark the correct choice as:

Assertion (A): The length of the minute hand of a clock is 7cm.Then the area swept by the minute hand in 5 minute is \frac{77}{6}\text{cm} ^2

Reason (R): The length of an arc of a sector of angle q and radius r is given by \text{l}=\frac{\theta}{360^\circ}\times2\pi\text{r}

A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false.

D Assertion (A) is false but reason (R) is true.

Ans: B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

1. Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

Q45.Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). **1 Mark**

Mark the correct choice as:

Assertion: If the outer and inner diameter of a circular path is 10m and 6m then area of the path is 16\pi\text{ m}^2

Reason: If R and r be the radius of outer and inner circular path =\pi(\text{R}^2-\text{r}^2)

A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

B Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

C Assertion (A) is true but reason (R) is false.

D Assertion (A) is false but reason (R) is true.

Ans: A Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Solution:

Both assertion and reason are correct. Also, Reason is the correct explanation of the assertion.

Area of the path =\pi\bigg[\big(\frac{10}{2}\big)^2-\big(\frac{6}{2}\big)^2\bigg]

=\pi(25-9)=16\pi

Q46. What is the area of a segment of a circle with radius r and angle subtended at the centre is 120^0? **1 Mark**

A { {πr^2 \over 3} - {\sqrt{3} a^2\over 2}}

B { {πr^2 \over 3} - {\sqrt{3} a^2\over 4}}

C { {πr^2 \over 6} - {\sqrt{3} a^2\over 4}}

D { {πr^2 \over 3} - {\sqrt{3} a^2\over 2}}

Ans: (B) { {πr^2 \over 3} - {\sqrt{3} a^2\over 4}}

We know that Area of segment = Area of sector - Area of Triangle

Here area of sector = x = {θ \over 360^0} \times π r^2 = {120^0 \over 360^0} \times π r^2 = {π r^2 \over 3}

And area of triangle = {1 \over 2} r^2 sin \theta = {1 \over 2} r^2 sin 120^0 ={1 \over 2} r^2 {{ \sqrt 3} \over 2} = { {\sqrt 3} \over 4} r^2

Q47. What is the area of a segment of a circle with radius r and angle subtended at the centre is 60^0? **1 Mark**

A { {πr^2 \over 6} - {\sqrt{3} r^2\over 2}}

B { {πr^2 \over 3} - {\sqrt{3} r^2\over 2}}

C { {πr^2 \over 6} - {r^2\over 2}}

D { {πr^2 \over 4} - {\sqrt{3} a^2\over 2}}

Ans: A. { {πr^2 \over 6} - {\sqrt{3} r^2\over 2}}