CHAPTER FOUR

AREA AND CIRCUMFRENCE OF A CIRCLE

MATHEMATICS

FOR GRADE 7

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MAY 2020

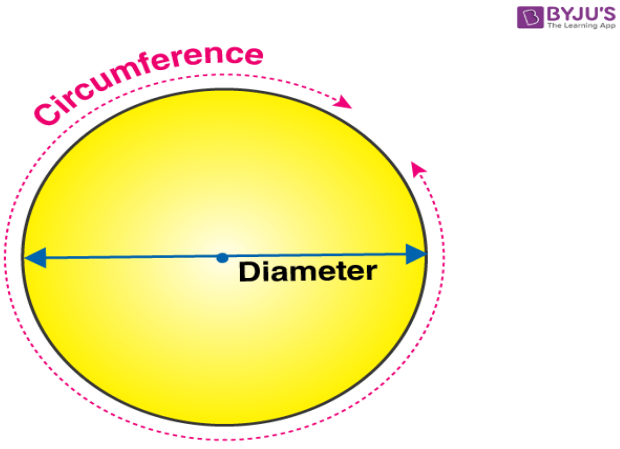
Objectives:-

after completing this section you should be able to do the following:

- To know what the number (π) is
- Find the circumference of the circle
- Find the Area of the circle

Circumference of the circle

- ✓ The perimeter of a circle is called its circumference.
- ✓ The circumference of a circle is related to its radius or diameter.



- Introducing (pi) For each circle the circumference of a circle divide by its diameter is approximately equal to 3.14 or $\frac{22}{7}$.
- The actual value is a special number represented by π. You can not write the exact value of π, because the number is a non-recurring or non-terminating decimal which is found some where between 3.141592 and 3.141593.

Finding a formula for the circumference

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- Representing the circumference by '**C**' and the diameter by '**d**', you can equate the ratio

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$$= \frac{Circumfrance}{Diameter} = \frac{C}{d} \approx \frac{22}{7} \approx 3.14 \approx \pi$$

$= = 3.14$

- To give a formula to find the circumference of a circle using its diameter.

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- Thus, $\frac{C}{d} = \frac{xd}{dx} \pi$ ..... Multiplying both sides by d

Thus, Multiplying both sides by d

So , $C = d\pi$

So , $C = d$

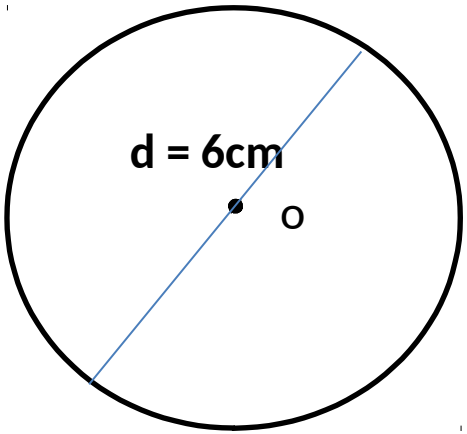
- You can also rewrite the formula for the circumference using the radius.

Since the diameter is twice the radius. (d = 2r)

So $C = \pi \times d = \pi \times 2r$

$= 2r\pi$

Example 1. Find the circumference of a circle with diameter 6cm ?



Solution: $C = d \times \pi$ ($\pi = 3.14$)

$C = \times 6\text{cm}$ $C = \pi \times 6\text{cm}$

$= 3.14 \times 6\text{cm}$

$= 18.84\text{cm}$ $= 18.84\text{cm}$

Therefore, the circumference of a circle is 18.84cm.

Area of a circle

- The area of a circle whose radius r unit long is given by

$$A = \pi r^2 = \frac{\pi d^2}{4}$$

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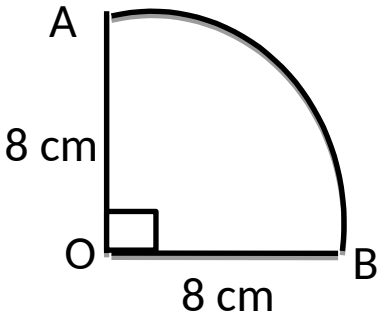
Example 2. Find the area of a circle with radius

Solution: $A \equiv \pi r^2$ for $r=10cm$

$\equiv 3.14 \times 10cm \times 10cm$

$\equiv 314sq.cm$

Example 3. In Figure below, find the area of the quarter circle of radius 8 cm. (use $\pi = 3.14$) ?



Solution: The given figure the radius 8 cm and quarter(1/4) of a circle

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$$A = \frac{1}{4}\pi r^2 = \frac{1}{4}(3.14)(8cm)^2$$

$A = 2 = \ ^2$

$$A = \frac{1}{4}(3.14)(64cm^2)$$

$A = \ ^2)$

$A = \ ^2$

$$A = 50.24cm^2$$

Therefore, the area of the quarter circle is $50.24cm2$

Therefore, the area of the quarter circle is $50.24cm2$

Example 4. If the area of a circle is $154 cm^2$, then find its circumference?

$$\left(\pi \approx \frac{22}{7}\right)$$

Solution: To find the radius, begin with $A = \pi r^2$ and put $A = 154\ cm^2$

Therefore, $A \equiv \pi r^2 = 154\ cm^2$

$= 154\ cm^2 = \frac{22}{7} r^2$

$r = 7cm$

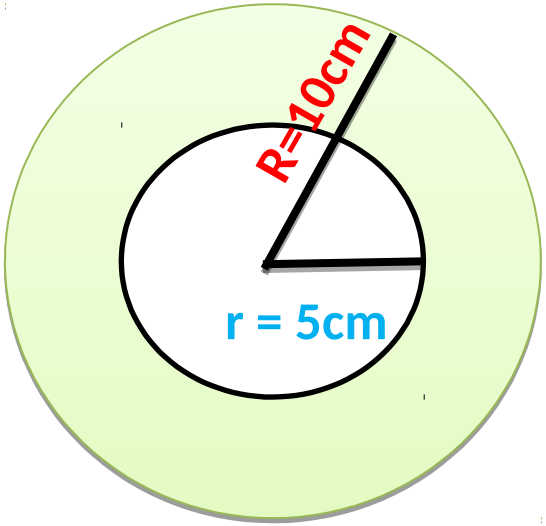
$C = 2r = 2(\ )7$

$C = 2\pi r = 2(\frac{22}{7})7$

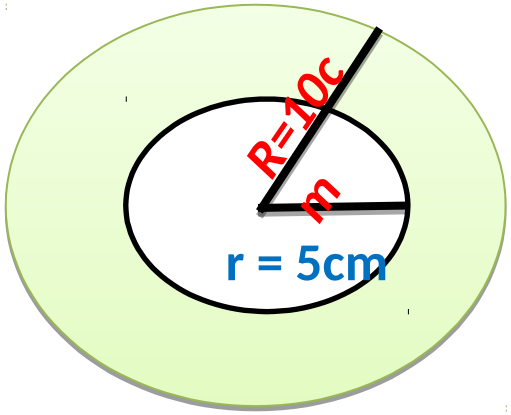
$= 44\ cm$

Therefore, the circumference of the circle is 44 cm

EXAMPLE 5. Find the shaded region of (annulus)figure?



Solution;



Area of annulus $= \pi R^2 - \pi r^2$

Area of annulus $R^2 - 2$

$= \pi (R^2 - r^2)$

$= (R^2 - 2)$

$= \pi ((10cm)^2 - (5cm)^2)$

$= ((10cm)^2 - (5cm)^2)$

$= \pi (100cm)^2 - (25cm)^2)$

$= (100cm)^2 - (25cm)^2)$

$= 75\pi cm^2$

$= 75\pi cm^2$

SUMMARY

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- The perimeter of a circle is called its circumference
- The diameter is twice the radius ($d = 2r$)
- $\frac{\text{Circumfrance}}{\text{Diameter}} = \frac{C}{d} \approx \frac{22}{7} \approx 3.14 \approx \pi$
- Area of an annulus $\equiv \pi R^2 - \pi r^2$

Area of an annulus $\equiv R^2 - 2$

$= (R^2 - 2)$

$= \pi (R^2 - r^2)$

Circumference of Circle	$2\pi r$	πd
Area of circle	Circumference of Circle	$2\pi r$ πd
	Area of circle	πr^2 $\frac{\pi d^2}{4}$
	Circumference of semi-circle	πr $\frac{\pi d}{2}$
	Area of semi-circle	$\pi r^2/2$ $\frac{\pi d^2}{8}$
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	Circumference of semi-circle	πr $\frac{\pi d}{2}$
	Area of semi-circle	$\pi r^2/2$ $\frac{\pi d^2}{8}$

ACTIVITY

1. **Find the area of a semicircle whose radius is 2.4 cm?**

2. **How many square meters of brick pavement must be laid for a 4meter wide walk around a circular flower bed 22 meters in diameter?**

3. **The circle inscribed in a 10cm side length of square, what is the area of the shaded region**

(use $\pi = 3.14$)