CHAPTER FOUR
GEOMETRIC FIGURES AND MEASUREMENT

CLASSIFICATION OF POLYGONS AND CIRCLES

MATHEMATICS

FOR GRADE 7

BY :ADDIS ABABA EDUCATION BUREAU

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POLYGONS AND PARTS OF CIRCLES

The outcome of this subunit:

After completing this lesson the students should be able to :-

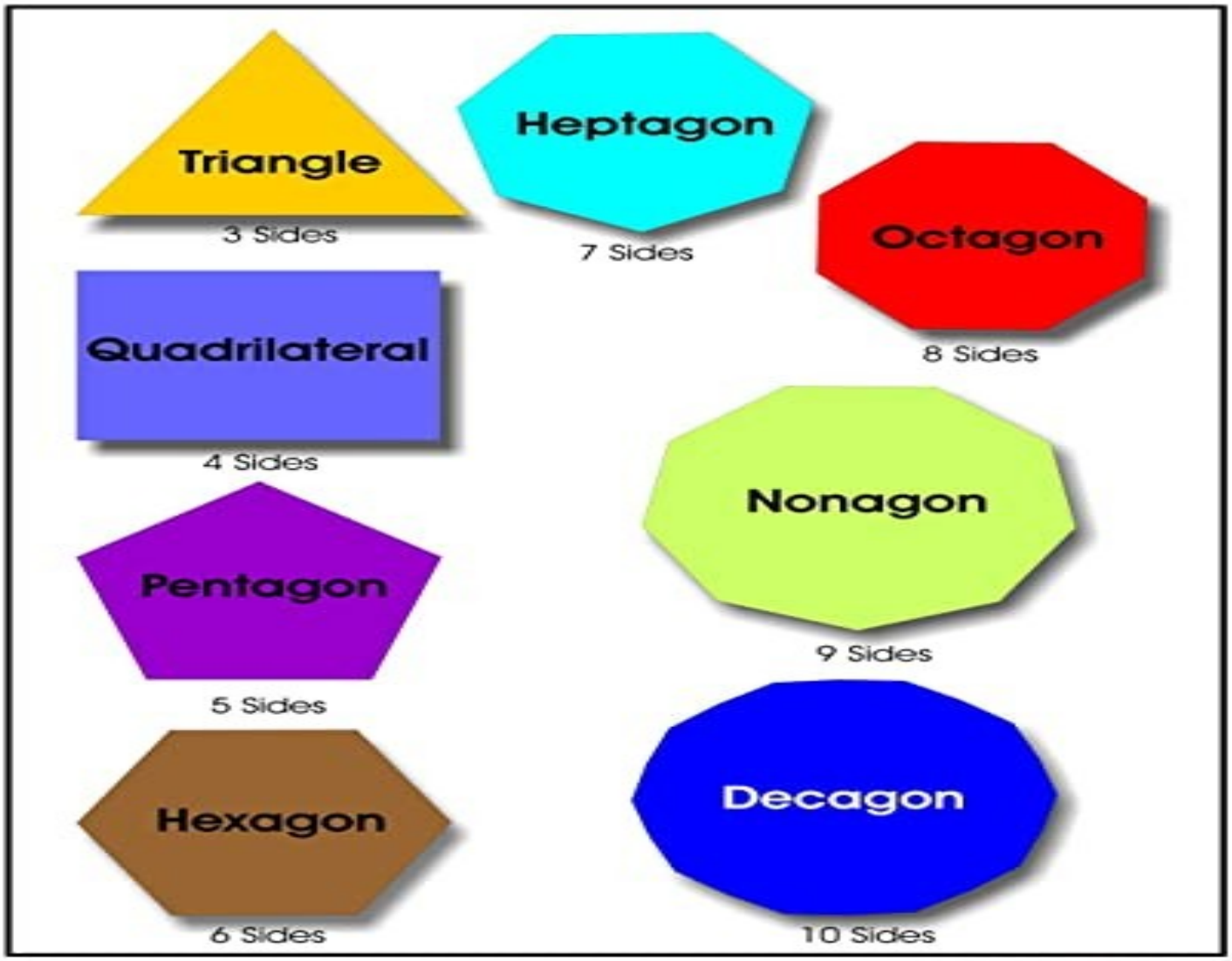
- ✓Name a polygon based on number of sides
- ✓Define what does it mean a circle
- ✓Define a chord , a diameter , radius of a circle
- ✓Define an arc and circumference of a circle



CLASSIFICATION OF POLYGON

- There are many types of polygons. Probably you heard some of them before, like squares, triangles, and rectangles.
- We'll learn more about these and others. Polygons are named for the number of sides they have. Here is a list of polygon names depending on the number of sides they have, starting with triangle

Polygons


Triangle
3 Sides
Heptagon
7 Sides
Octagon
8 Sides
Quadrilateral
4 Sides
Nonagon
9 Sides
Pentagon
5 Sides
Hexagon
6 Sides
Decagon
10 Sides
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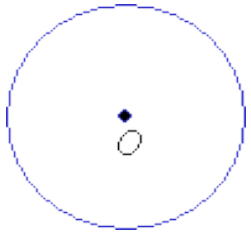


Sides	Polygon
11	Hendecagon
12	Didecagon
13	Tridecagon
14	Tetradecagon
15	Pentadecagon
16	Hexadecagon
17	Heptadecagon
18	Octadecagon
19	Enneadecagon
20	Icosagon

There are, of course, polygons with many more names and sides. When the number of sides gets really high, mathematicians sometimes use the number of sides "n" and call it an n-gon. For example if a polygon has 24 sides, it would be called a 24-gon.

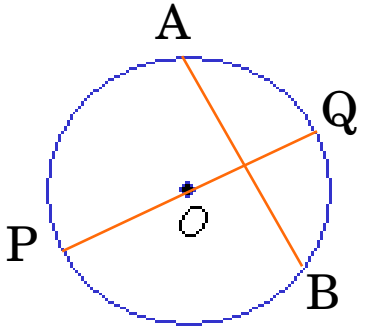
CIRCLES

- **Definition** : A circle is the set of all points in a plane that are equidistance from a fixed point called the center of the circle.



Note: 1. a circle is usually named by its center .in the above figure the circle can named as circle O

2. **A chord** of a circle is a line segment with both endpoints on the circle. The line segment $\overline{AB}$ and $\overline{PQ}$ are chord of the circle.



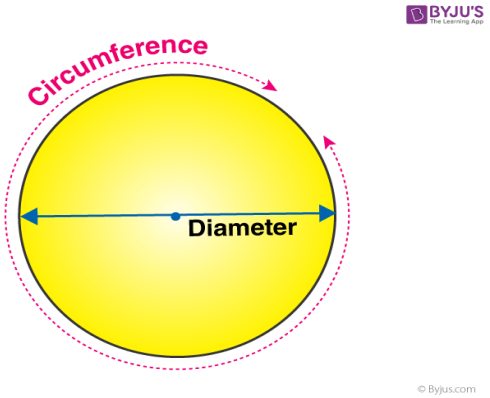
3. a diameter of a circle is any chord passes through the center and denoted by ‘ **d** ’.

- A diameter is the biggest chord of the circle. In the above figure the chord PQ is the diameter of the circle

4. a radius of a circle is a line segment from the center of the circle to a point on the circle. The plural of radius is radii.

- In the above diagram, $\overline{O}$ is the center of the circle and $\overline{OP}$ and $\overline{OQ}$ are radii of the circle.
- The radii of a given circle are all the same length.

5. Circumference of a circle is the complete path around the circle.

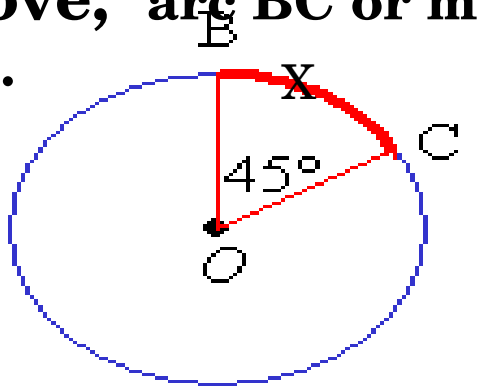


6. An arc is a part of the circumference.

In the diagram below , the part of the circle from B to C forms an arc.

- An arc can be measured in degrees.

In the circle above, arc BC or m(BXC) is equal to the ∠BOC that is 45°.



- The relationship between a radius and the diameter of a circle.

-The radius is **half** the length of the diameter

(**d= 2r** where

d is diameter and **r** is radius of the circle)

Worked examples

1.What is the length of the diameter of a circle, if the length of a radius is 12cm?

Solution :- let radius (r) = 12cm

then diameter(d) = 2r

= 2(12cm)

= 24cm

Therefore the diameter of a circle is 24 cm



SUMMARY

- Name of a polygon is termed according to the number of sides they have. Though polygon can have an infinite number of sides and can be termed according to the number of sides . Suppose a polygon consist of 3 sides then it is known as a triangle, but if a polygon consists of 33 sides it will be known as 33-gon.
- **Triangle:** The **three**-sided polygon ..
- **Quadrilateral:** Any figure which is a closed **four**-sided figure .
- **Pentagon:** The closed figure which is formed by **five** straight lines.
- **Hexagon:** The **six**-sided polygon .
- **Heptagon:** The polygon with **seven** sides .
- **Octagon:** As the name says, the **Eight-**sided polygon .
- **Nonagon:** The polygon which possesses **nine** straight lines.
- **Decagon:** The closed figure made with **ten** straight lines.
- **Dodecagon:** The polygon with **twelve** sides is .
- **n-gon**: The **n**-sided polygon .

- A circle is the set of all points in a plane that are equidistance from a fixed point called the center of the circle.
- A chord of a circle is a line segment with both endpoints on the circle
- A diameter of a circle is any chord passes through the center
- A radius of a circle is a line segment from the center of the circle to any point on the circle.
- **Circumference** of a circle is the complete path around the circle.
- **An arc is a part of the circumference.**

  - An arc can be measured in degrees.

- The radius is **half** the length of the diameter. (**d= 2r**)

ACTIVITY 2

- Give answer for the following questions

1. What is the number of sides of an **Icosagon**?
2. What is the largest chord of a circle?
3. What is the radius of a circle , if the diameter is 50 cm ?