

BASIC GEOMETRICAL IDEAS

Class – 6

Part - 1

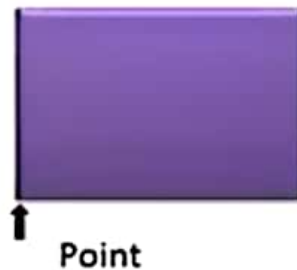
- ☐ Point
- ☐ Line
- ☐ Intersecting Lines
- ☐ Parallel Lines
- ☐ Collinear Points
- ☐ Concurrent Lines
- ☐ Line Segment
- ☐ Ray
- ☐ Curves
- ☐ Polygon



Point

- ❖ A point determines a location.
- ❖ A point does not have any size.
- ❖ A point has no length, breadth or height.

A •



Square



A Point

Point A

A

Point C

C

Point B

B

Line Segment

- ❖ The part of a line that connects two points.
- ❖ A line segment is a portion of a line.
- ❖ It is the shortest distance between the two points.
- ❖ It has a length.



A Line Segment



Line

- ❖ The word line refers to straight line.
- ❖ A line has no width it has just length.
- ❖ A line can be extended in both the directions.



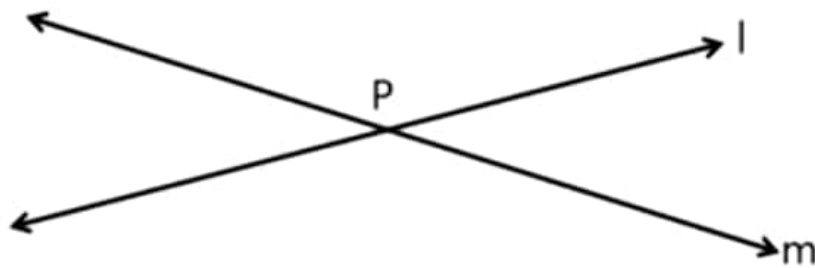
A Line

It is interesting to note that a line contains infinite points.



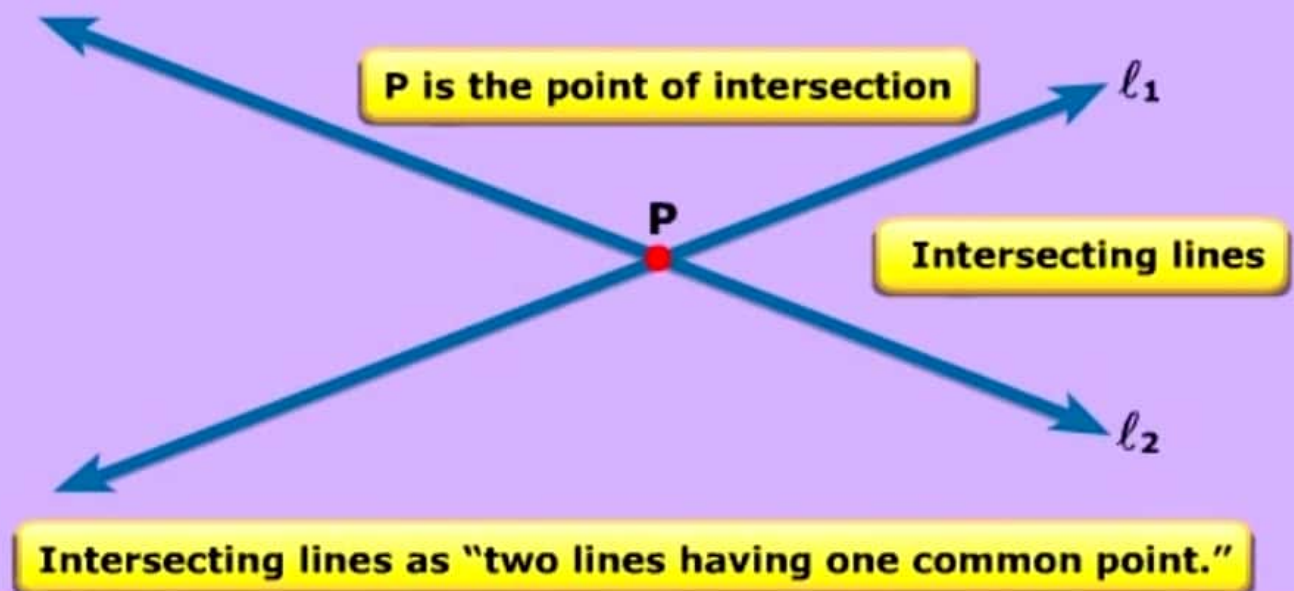
Intersecting Lines

- ❖ If two lines have one common point they are called intersecting lines.
- ❖ Two lines intersect each other.



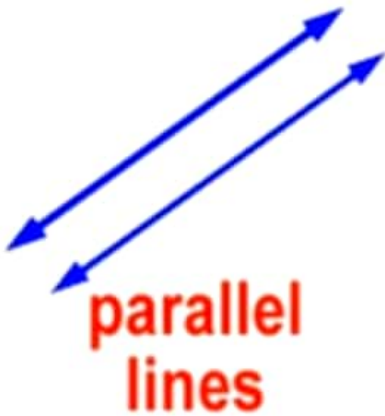
In the above figure line *l* and line *m* intersect each other at *p*

Intersecting Lines



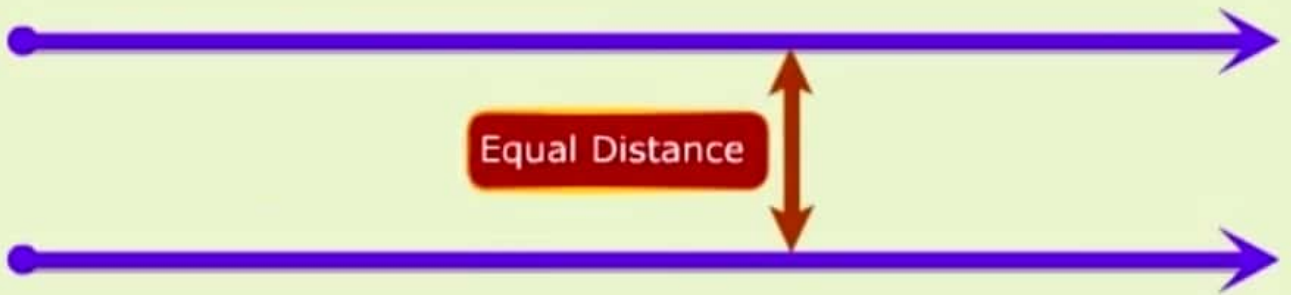
Parallel Lines

- ❖ Lines which do not meet or intersect each other are called Parallel Lines.
- ❖ Lines are parallel if they are always the same distance apart and will never meet.
- ❖ Examples :



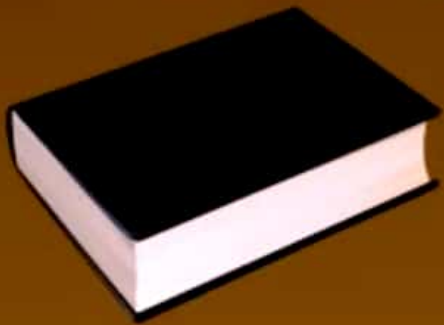
Parallel Lines

Parallel lines



Parallel Lines

Edges of a book



Tracks of railway lines



Sides of a road



Ray

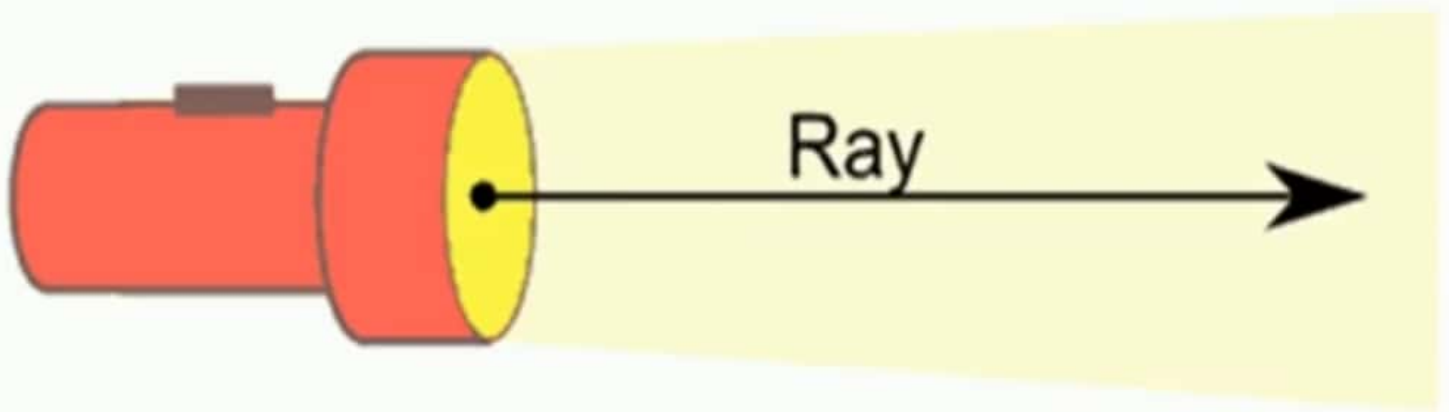
- ❖ The part of a line that extends indefinitely in one direction from a point is called a ray.
- ❖ It has only one end point.



Ray



Ray



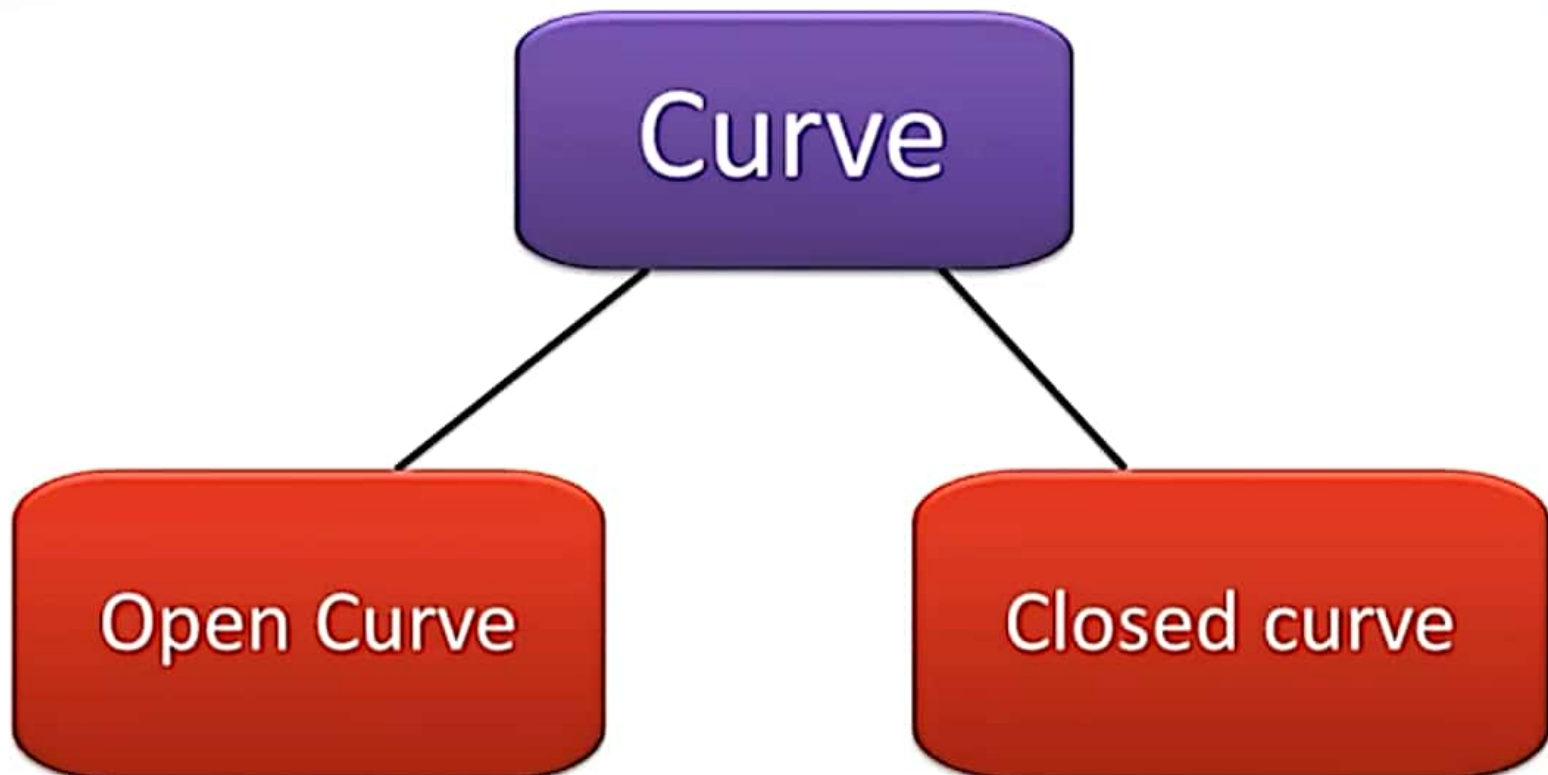
Understanding Ray

Point of origin

Point of extension

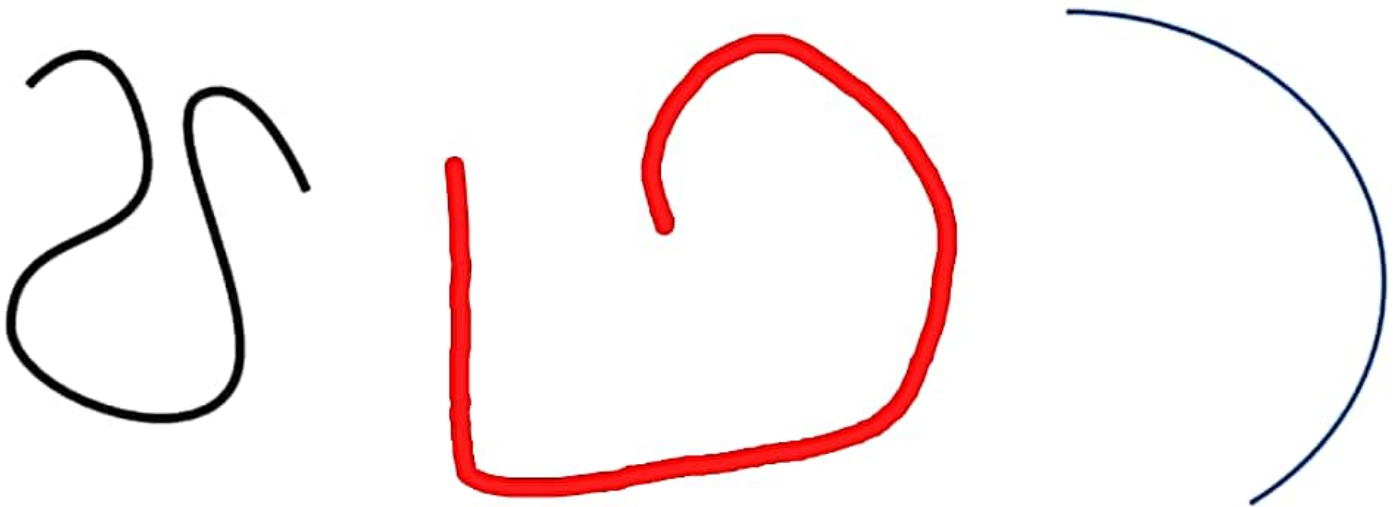


Curve



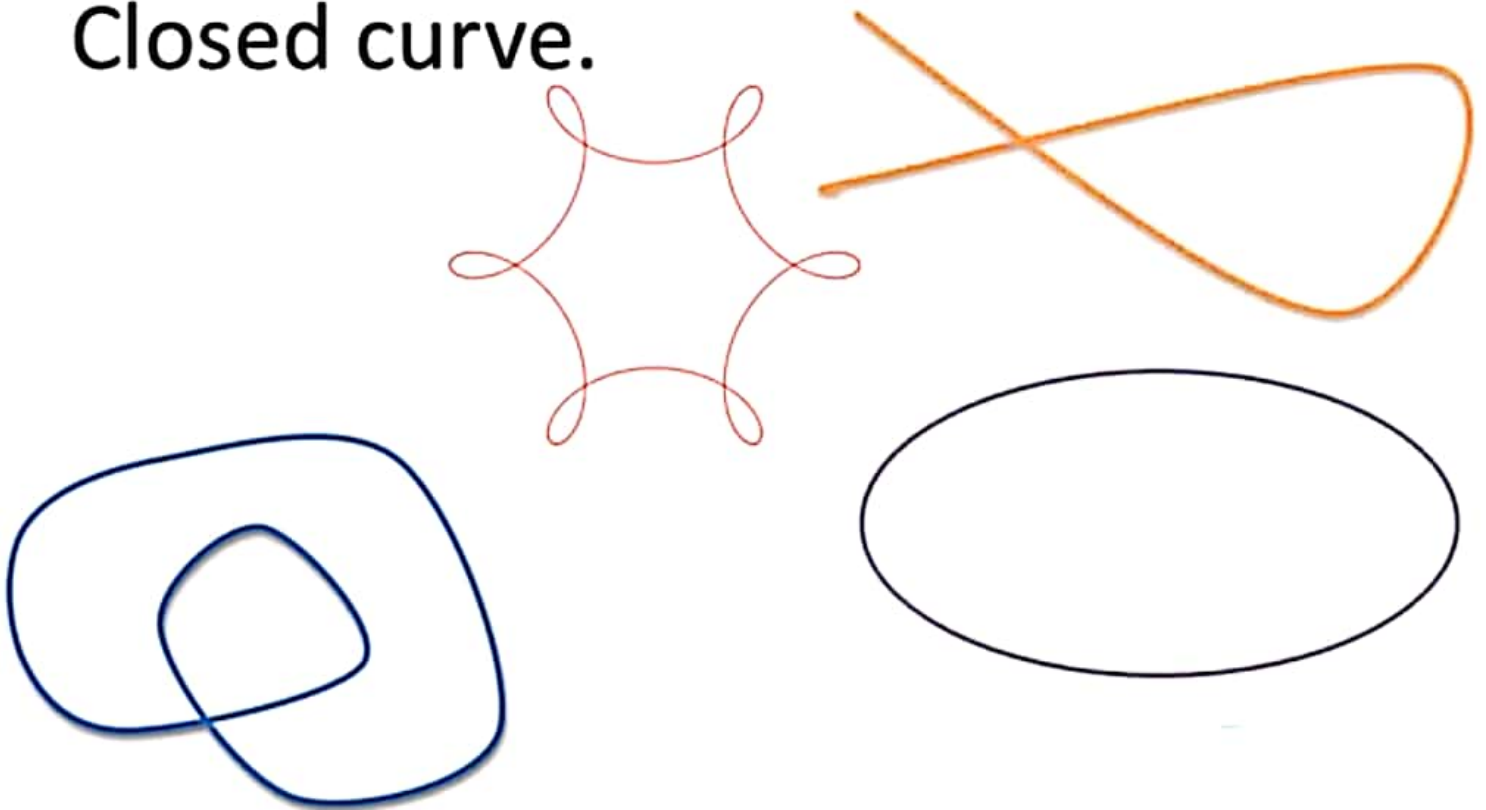
Open Curve

❖ A curve which does not cut itself is called open curve.



Closed Curve

❖ A curve which cut itself is called Closed curve.

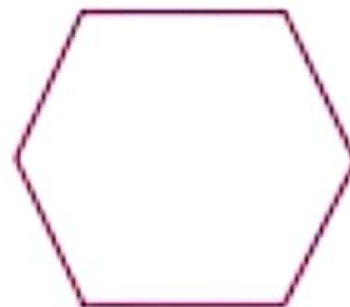
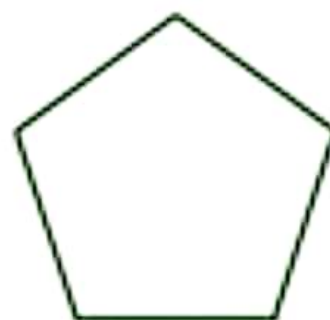
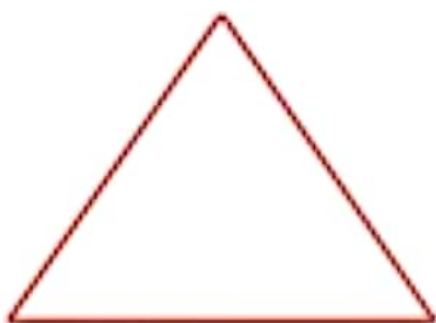




Polygons



A **polygon** is a plane closed figure bounded by line segments.



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Polygon





- ❖ A line segment forming a polygon are called its sides.
- ❖ The end-points of its line segment is called its vertices.
- ❖ The meeting point of a pair of sides is called a vertex of the polygon.



Components of a Polygon

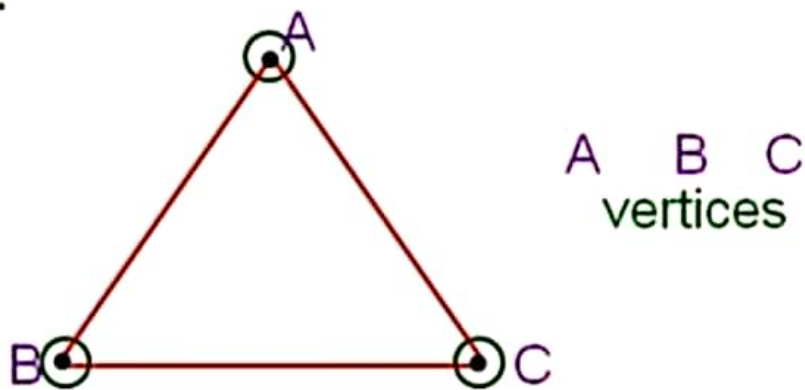


Four main components of a Polygon are:

-  **Sides**
-  **Vertices**
-  **Adjacent Vertices**
-  **Diagonals**



Vertices



In this figure, sides \overline{AB} and \overline{AC} meet at point A.

So, 'A' is the vertex of the polygon ABC.

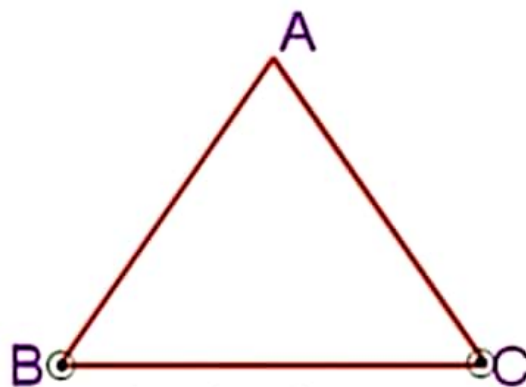
Similarly, B and C are also vertices of the polygon ABC.



Adjacent Vertices

End points
of side AB

•A •B



•A •C
End points
of side AC

End points
of side BC

•B •C

The end points of the same side of a polygon are known as **adjacent vertices**.

Therefore, the pairs of adjacent vertices are:
{A,B}, **{B,C}** and **{C,A}**.

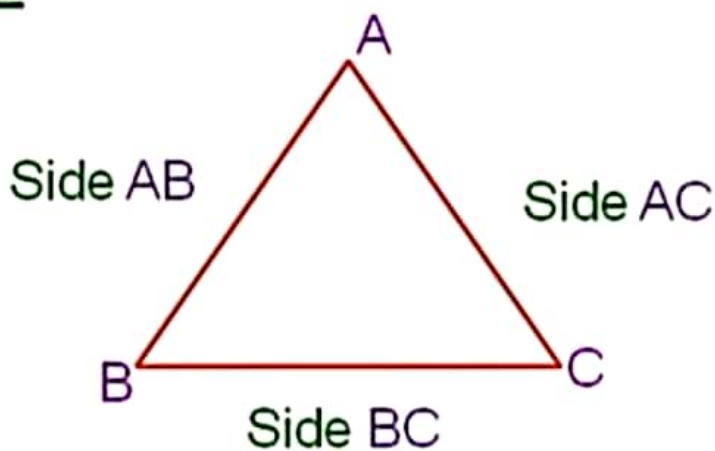


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Sides



In the above figure, \overline{AB} , \overline{BC} and \overline{CA} are the sides of a polygon.

Thus, all **line segments** forming a polygon are known as the **sides** of the polygon.



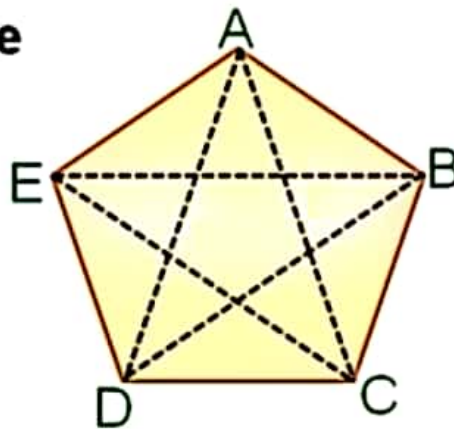
Diagonal



Consider the pair of vertices which are not adjacent for the below polygon.

These are: $\{A,C\}$; $\{A,D\}$; $\{B,D\}$; $\{B,E\}$; $\{C,E\}$.

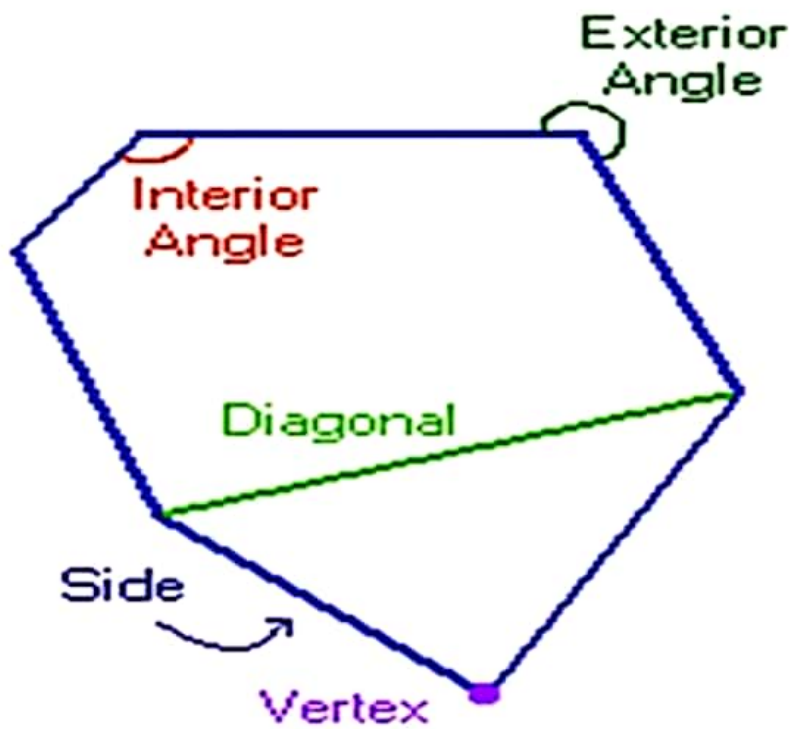
Now, let us join these pairs...



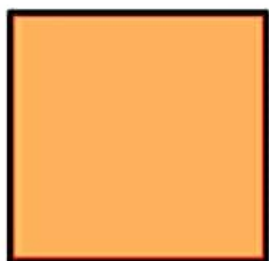
The line obtained by joining two vertices which are not adjacent is called a diagonal.



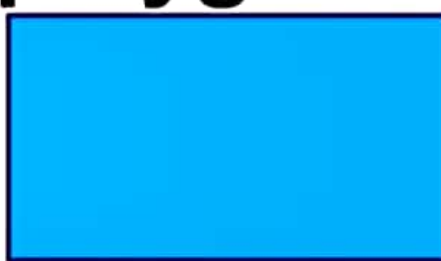
Polygon



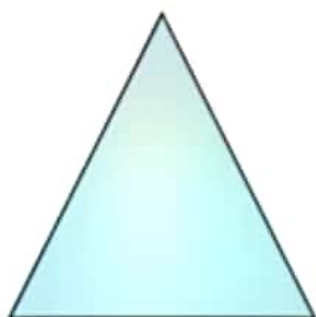
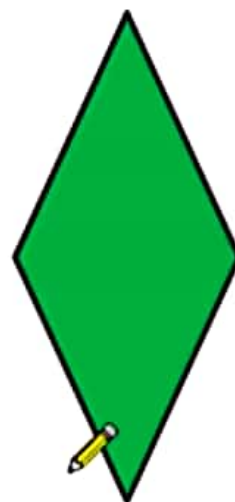
Most of the common shapes are polygons



Square



Rectangle



Triangle



Star

