

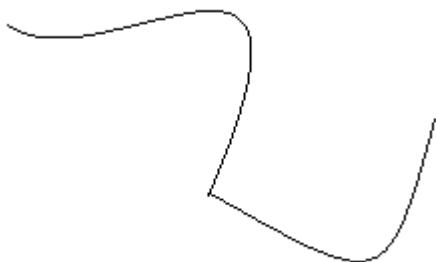
EXERCISE 15.1**PAGE NO: 15.5****1. Draw rough diagrams to illustrate the following:**

- (i) Open curve
- (ii) Closed curve

Solution:

Here is the illustration of

- (i) Open curve



- (ii) Closed curve

**2. Classify the following curves as open or closed:**

(i)



(ii)



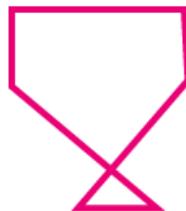
(iii)



(iv)



(v)



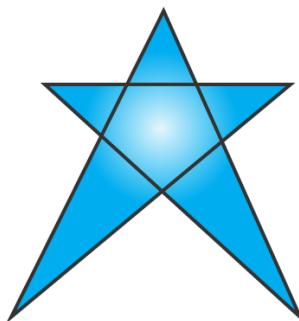
(vi)

Solution:

- (i) Open curve
- (ii) Closed curve
- (iii) Closed curve
- (iv) Open curve
- (v) Open curve
- (vi) Closed curve

3. Draw a polygon and shade its interior. Also draw its diagonals, if any.**Solution:**

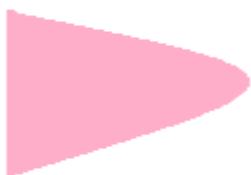
Here is the polygon with diagonals and with its interior shaded.

**4. Illustrate, if possible each one of the following with a rough diagram.**

- (i) A closed curve that is not a polygon.
- (ii) An open curve made up entirely of line segments.
- (iii) A polygon with two sides.

Solution:

- (i) A closed curve that is not a polygon.



- (ii) An open curve made up entirely of line segments.



(iii) A polygon with two sides.

A polygon with two sides is not possible because, a polygon should have minimum three sides.

5. Following are some figures: Classify each of these figures on the basis of the following:

- (i) Simple curve (ii) Simple closed curve (iii) Polygon**
- (iv) Convex polygon (v) Concave polygon (vi) Not a curve**



(i)



(ii)



(iii)



(iv)



(v)



(vi)



(vii)



(viii)

Solution:

- (i) It is a Simple Closed curve and a concave polygon. This is a simple closed curve and as a concave polygon all the vertices are not pointing outwards.
- (ii) It is a Simple closed curve and a convex polygon. This is a simple closed curve and as a convex polygon all the vertices are pointing outwards.
- (iii) It is Not a curve and hence it is not a polygon.
- (iv) It is Not a curve and hence it is not a polygon.
- (v) It is a Simple closed curve but not a polygon.
- (vi) It is a Simple closed curve but not a polygon.
- (vii) It is a Simple closed curve but not a polygon.

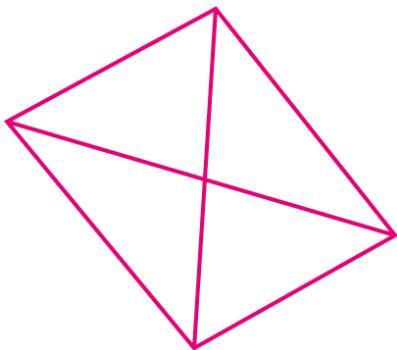
(viii) It is a Simple closed curve but not a polygon.

6. How many diagonals does each of the following have?

- (i) A convex quadrilateral
- (ii) A regular hexagon
- (iii) A triangle

Solution:

- (i) A convex quadrilateral

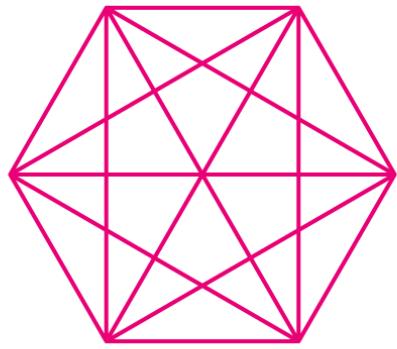


For a convex quadrilateral we shall use the formula $n(n-3)/2$

$$\text{So, number of diagonals} = 4(4-3)/2 = 4/2 = 2$$

A convex quadrilateral has 2 diagonals.

- (ii) A regular hexagon

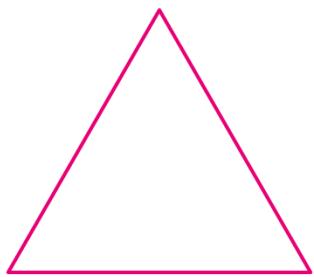


For a regular hexagon we shall use the formula $n(n-3)/2$

$$\text{So, number of diagonals} = 6(6-3)/2 = 18/2 = 9$$

A regular hexagon has 9 diagonals.

(iii) A triangle



For a triangle we shall use the formula $n(n-3)/2$

So, number of diagonals = $3(3-3)/2 = 0/2 = 0$

A triangle has no diagonals.

7. What is a regular polygon? State the name of a regular polygon of

- (i) 3 sides
- (ii) 4 sides
- (iii) 6 sides

Solution:

Regular Polygon: A regular polygon is an enclosed figure. In a regular polygon minimum sides are three.

(i) 3 sides

A regular polygon with 3 sides is known as Equilateral triangle.

(ii) 4 sides

A regular polygon with 4 sides is known as Rhombus.

(iii) 6 sides

A regular polygon with 6 sides is known as Regular hexagon.