

EXERCISE 15.1

Draw rough diagrams to illustrate the following:

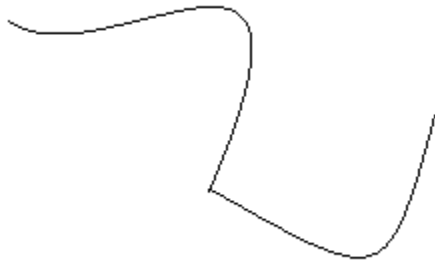
(i) Open curve

(ii) Closed curve

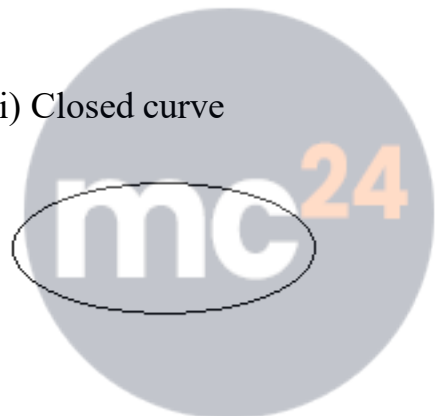
Solution:

Here is the illustration of

(i) Open curve



(ii) Closed curve



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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?

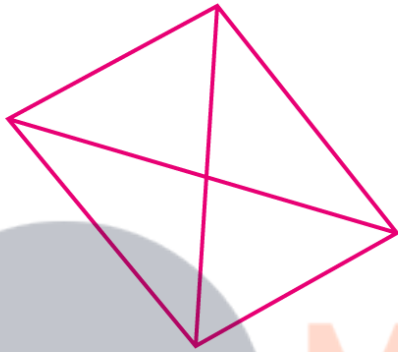
(i) A convex quadrilateral

(ii) A regular hexagon

(iii) A triangle

Solution:

(i) A convex quadrilateral

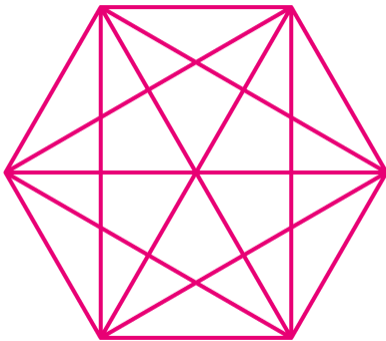


For a convex quadrilateral we shall use the formula $n(n-3)/2$

So, number of diagonals = $4(4-3)/2 = 4/2 = 2$

A convex quadrilateral has 2 diagonals.

(ii) A regular hexagon

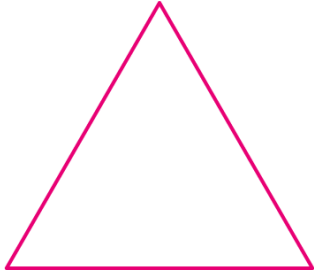


For a regular hexagon we shall use the formula $n(n-3)/2$

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.