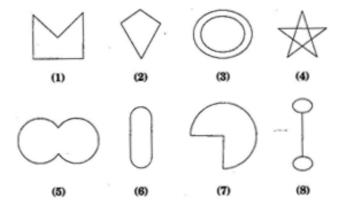


NCERT solutions for class 8 Maths Chapter 3.1 Understanding Quadrilaterals

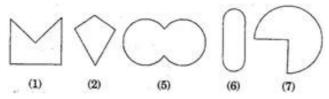
Q1. Given here are some figures:



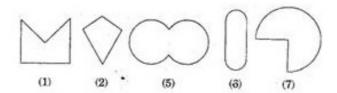
Classify each of them on the basis of the following:

- (a) Simple curve
- (b) Simple closed curve
- (c) Polygon
- (d) Convex polygon
- (e) Concave polygon

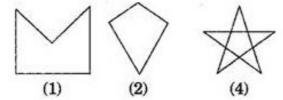
Ans: (a) Simple curve



(b) Simple closed curve



(c) Polygons



(d) Convex polygons



(e) Concave polygon



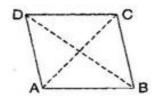


Q2. How many diagonals does each of the following have?

- (a) A convex quadrilateral
- (b) A regular hexagon
- (c) A triangle

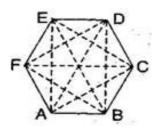
Ans: (a) A convex quadrilateral has two diagonals.

Here, AC and BD are two diagonals.



(b) A regular hexagon has 9 diagonals.

Here, diagonals are AD, AE, BD, BE, FC, FB, AC, EC and FD.



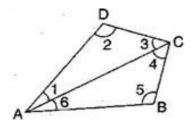
(c) A triangle has no diagonal.

Q3. What is the sum of the measures of the angles of a convex quadrilateral? Will this property hold if the quadrilateral is not convex? (Make a non-convex quadrilateral and try)

Ans: Let ABCD is a convex quadrilateral, then we draw a diagonal AC which divides the quadrilateral in two triangles.

$$\angle A + B + \angle C + \angle D$$

= $\angle 1 + \angle 6 + \angle 5 + \angle 4 + \angle 3 + \angle 2$
= $(\angle 1 + \angle 2 + \angle 3) + (\angle 4 + \angle 5 + \angle 6)$



 $= 180^{\circ} + 180^{\circ}$

[By Angle sum property of triangle]

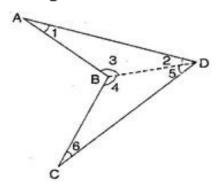
= 360°

Hence, the sum of measures of the triangles of a convex quadrilateral is 360°.

Yes, if quadrilateral is not convex then, this property will also be applied.

Let ABCD is a non-convex quadrilateral and join

BD, which also divides the quadrilateral in two triangles.



Using angle sum property of triangle,

In
$$\triangle ABD$$
, $\angle 1 + \angle 2 + \angle 3 = 180^{\circ}$ (i)

In
$$\triangle$$
BDC, $\angle 4 + \angle 5 + \angle 6 = 180^{\circ}$ (i)

Adding eq. (i) and (ii),

$$\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5 + \angle 6 = 360^{\circ}$$

$$\Rightarrow \angle_1 + \angle_2 + (\angle_3 + \angle_4) + \angle_5 + \angle_6$$

$$\Rightarrow \angle A + \angle B + \angle C + \angle D = 360^{\circ}$$

Hence proved.

Q4. Examine the table. (Each figure is divided into triangles and the sum of the angles deduced from that.)

Figure				
Side	3	4	5	6
Angle sum	$ \begin{array}{c} 1 \times 180^{\circ} \\ = (3-2) \times 180^{\circ} \end{array} $	$ \begin{array}{c} 2 \times 180^{\circ} \\ = (4 - 2) \times 180^{\circ} \end{array} $	$ 3 \times 180^{\circ} \\ = (5-2) \times 180^{\circ} $	$ \begin{array}{c} 4 \times 180^{\circ} \\ = (6 - 2) \times 180^{\circ} \end{array} $

What can you say about the angle sum of a convex polygon with number of sides?

Ans: (a) When n = 7, then

Angle sum of a polygon = $(n-2) \times 180^{\circ}$

$$=(7-2)\times180^{\circ}=5\times180^{\circ}=900^{\circ}$$

(b) When n = 8, then

Angle sum of a polygon = $(n-2)\times180^{\circ}$

$$=(8-2)\times180^{\circ}=6\times180^{\circ}=1080^{\circ}$$

(c) When n = 10, then

Angle sum of a polygon = $(n-2)\times180^{\circ}$

$$=(10-2)\times180^{\circ}=8\times180^{\circ}=1440^{\circ}$$

(d) When n = n, then

Angle sum of a polygon = $(n-2) \times 180^{\circ}$

Q5. What is a regular polygon? State the name of a regular polygon of:

- (a) 3 sides
- (b) 4 sides
- (c) 6 sides

Ans: A regular polygon: A polygon having all sides of equal length and the interior angles of equal size is known as regular polygon.

(i) 3 sides

Polygon having three sides is called a triangle.

(ii) 4 sides

Polygon having four sides is called a **quadrilateral**.

(iii) 6 sides

Polygon having six sides is called a **hexagon**.

********* END *******