

EXERCISE 8.2

1. Diagonals AC and BD of a parallelogram ABCD intersect each other at O. If $OA = 3$ cm and $OD = 2$ cm, determine the lengths of AC and BD.

Solution:

According to the question,

$$OA = 3 \text{ cm}$$

$$OD = 2 \text{ cm}$$

We know that,

Diagonals of parallelogram bisect each other.

Then,

$$AC = 2AO$$

$$AC = 2 \times 3 \text{ cm}$$

$$AC = 6 \text{ cm}$$

And,

$$BD = 2OD$$

$$BD = 2 \times 2 \text{ cm}$$

$$BD = 4 \text{ cm}$$

Hence, $AC = 6$ cm and $BD = 4$ cm

2. Diagonals of a parallelogram are perpendicular to each other. Is this statement true? Give reason for your answer.

Solution:

The statement “diagonals of a parallelogram are perpendicular to each other” is false.

Justification:

Diagonals of a parallelogram bisect each other but not at 90° .

So, they are not perpendicular to each other.

Hence, this statement is false.

3. Can the angles 110° , 80° , 70° and 95° be the angles of a quadrilateral? Why or why not?

Solution:

The angles 110° , 80° , 70° and 95° cannot be the angles of a quadrilateral.

Justification:

We know that,

$$\text{Sum of all angles of a quadrilateral} = 360^\circ$$

Sum of given angles,

$$110^\circ + 80^\circ + 70^\circ + 95^\circ = 355^\circ \neq 360^\circ$$

Hence, 110° , 80° , 70° and 95° cannot be the angles of a quadrilateral.

4. In quadrilateral ABCD, $\angle A + \angle D = 180^\circ$. What special name can be given to this quadrilateral?

Solution:

According to the question,

$$\text{In quadrilateral ABCD, } \angle A + \angle D = 180^\circ$$

We know that,

In a trapezium,

Sum of co-interior angles = 180°
Hence, the given quadrilateral is a trapezium.

5. All the angles of a quadrilateral are equal. What special name is given to this quadrilateral?

Solution:

According to the question,
All the angles of a quadrilateral are equal.
Suppose all the angles of the quadrilateral = x
We know that,
Sum of all angles of a quadrilateral = 360°
 $\Rightarrow x + x + x + x = 360^\circ$
 $\Rightarrow 4x = 360^\circ$
 $\Rightarrow x = 360^\circ/4$
 $\Rightarrow x = 90^\circ$
Hence, the quadrilateral is a rectangle.

6. Diagonals of a rectangle are equal and perpendicular. Is this statement true? Give reason for your answer.

Solution:

The statement “diagonals of a rectangle are equal and perpendicular” is false.
We know that,
Diagonals of a rectangle bisect each other.
Therefore, they are equal but they are not perpendicular.
Hence, the statement is not true.

7. Can all the four angles of a quadrilateral be obtuse angles? Give reason for your answer.

Solution:

All the four angles of a quadrilateral cannot be obtuse angles.
Justification:
We know that,
Sum of all angles of a quadrilateral = 360°
So, at least one angle should be acute angle.
Hence, all the four angles of a quadrilateral cannot be obtuse angles.