

Quadrilaterals

Answer :

- (i) 4
- (ii) 4
- (iii) 4, co-linear
- (iv) 2
- (v) opposite
- (vi) 360°

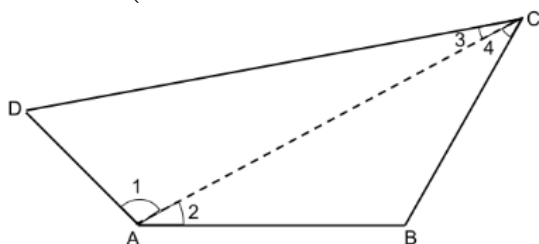
Q2.

Answer :

- (i) There are four pairs of adjacent sides, namely (AB,BC) , (BC,CD) , (CD,DA) and (DA,AB) .
- (ii) There are two pairs of opposite sides, namely (AB,DC) and (AD,BC) .
- (iii) There are four pairs of adjacent angles, namely $\angle A, \angle B$, $\angle B, \angle C$, $\angle C, \angle D$ and $\angle D, \angle A$.
- (iv) There are two pairs of opposite angles, namely $\angle A, \angle C$ and $\angle B, \angle D$.
- (v) There are two diagonals, namely AC and BD .

Answer :

Q3.



Let $ABCD$ be a quadrilateral.
Join A and C .

Now, we know that the sum of the angles of a triangle is 180° .

$$\text{For } \triangle ABC: \angle 2 + \angle 4 + \angle B = 180^\circ \quad \dots (1)$$

$$\text{For } \triangle ADC: \angle 1 + \angle 3 + \angle D = 180^\circ \quad \dots (2)$$

For $\triangle ADC$:

$$\angle 1 + \angle 3 + \angle D = 180^\circ \quad \dots (2)$$

Adding (1) and (2):

$$(\angle 1 + \angle 2 + \angle 3 + \angle 4) + \angle B + \angle D = 360^\circ$$

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

Hence, the sum of all the angles of a quadrilateral is 360° .

Q4.

Answer :

Sum of all the four angles of a quadrilateral is 360° .

$$\text{Let the unknown angle be } x^\circ. 76 + 54 + 108 + x = 360 \implies 238 + x = 360 \implies x = 122$$

The fourth angle measures 122° .

Q5

Answer :

Let the measures of the angles of the given quadrilateral be $(3x)^\circ, (5x)^\circ, (7x)^\circ$ and $(9x)^\circ$.
Sum of all the angles of a quadrilateral is 360° .
 $3x + 5x + 7x + 9x = 360$
 $24x = 360$
 $x = 15$

$$\text{Angles measure: } (3 \times 15)^\circ = 45^\circ, (5 \times 15)^\circ = 75^\circ, (7 \times 15)^\circ = 105^\circ, (9 \times 15)^\circ = 135^\circ$$

Q6

Answer :

Sum of the four angles of a quadrilateral is 360° .

If the unknown angle is x° , then:

$$75 + 75 + 75 + x = 360 \implies 225 + x = 360 \implies x = 135$$

The fourth angle measures 135° .

Q7.

Answer :

Let the three angles measure x° each.

Sum of all the angles of a quadrilateral is 360° .

$$\therefore x+x+x+120=360 \quad 3x+120=360 \quad 3x=240 \quad x=240/3=80$$

Each of the equal angles measure 80° .

∩

Answer :

Sum of the angles of a quadrilateral is 360° .

$$\therefore \angle A + \angle B + 60^\circ + 100^\circ = 360^\circ \quad \angle A + \angle B = 360^\circ - 100^\circ - 60^\circ = 200^\circ \text{ or } \angle A + \angle B = 100^\circ \quad \dots (1)$$

Sum of the angles of a triangle is 180° . In $\triangle APB$: $\angle A + \angle B + \angle P = 180^\circ$

Using equation (1): $100^\circ + \angle P = 180^\circ \Rightarrow \angle P = 80^\circ$

$$\therefore \angle APB = 80^\circ$$