



### Exercise 16A

Q1

Answer :

It is given that  $ABCD$  is a parallelogram in which  $\angle A$  is equal to  $110^\circ$ .  
Sum of the adjacent angles of a parallelogram is  $180^\circ$ .

$$\begin{aligned}\therefore \angle A + \angle B &= 180^\circ \\ \Rightarrow 110^\circ + \angle B &= 180^\circ \\ \Rightarrow \angle B &= (180^\circ - 110^\circ) \\ \Rightarrow \angle B &= 70^\circ \\ \therefore \angle B &= 70^\circ\end{aligned}$$

$$\begin{aligned}\text{Also, } \angle B + \angle C &= 180^\circ \\ \Rightarrow 70^\circ + \angle C &= 180^\circ \\ \Rightarrow \angle C &= (180^\circ - 70^\circ) \\ \Rightarrow \angle C &= 110^\circ \\ \therefore \angle C &= 110^\circ \\ \text{Further, } \angle C + \angle D &= 180^\circ \\ \Rightarrow 110^\circ + \angle D &= 180^\circ \\ \Rightarrow \angle D &= (180^\circ - 110^\circ) \\ \Rightarrow \angle D &= 70^\circ \\ \therefore \angle D &= 70^\circ\end{aligned}$$

Q2

Answer :

Let the required angle be  $x^\circ$ .

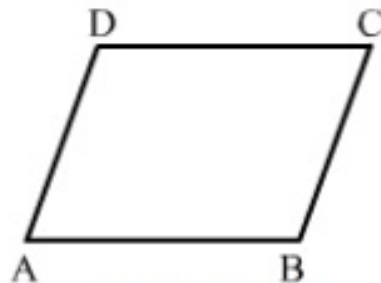
As the adjacent angles are equal, we have :

$$\begin{aligned}x + x &= 180 && (\text{since the sum of adjacent angles of a parallelogram is } 180^\circ) \\ \Rightarrow 2x &= 180 \\ \Rightarrow x &= \frac{180}{2} \\ \Rightarrow x &= 90^\circ\end{aligned}$$

Hence, the measure of each of the angles is  $90^\circ$ .

Q3

Answer :



Let  $ABCD$  be the parallelogram.

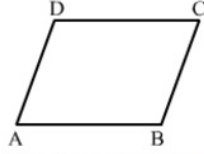
Then,  $\angle A$  and  $\angle B$  are its adjacent angles.

$$\text{Let } \angle A = (4x)^\circ$$

$$\angle B = (5x)^\circ$$

$\therefore \angle A + \angle B = 180^\circ$  [since sum of the adjacent angles of a parallelogram is  $180^\circ$ ]  
 $\Rightarrow 4x + 5x = 180$   
 $\Rightarrow 9x = 180$   
 $\Rightarrow x = \frac{180}{9}$   
 $\Rightarrow x = 20$   
 $\therefore \angle A = (4 \times 20)^\circ = 80^\circ$   
 $\angle B = (5 \times 20)^\circ = 100^\circ$   
 Opposite angles of parallelogram are equal.  
 $\therefore \angle C = \angle A = 80^\circ$   
 $\angle D = \angle B = 100^\circ$

Q4



Let  $ABCD$  be a parallelogram.

Let  $\angle A = (3x - 4)^\circ$

$\angle B = (3x + 16)^\circ$

$\therefore \angle A + \angle B = 180^\circ$  [since the sum of adjacent angles of a parallelogram is  $180^\circ$ ]

$$\Rightarrow 3x - 4 + 3x + 16 = 180$$

$$\Rightarrow 3x - 4 + 3x + 16 = 180$$

$$\Rightarrow 6x + 12 = 180$$

$$\Rightarrow 6x = 168$$

$$\Rightarrow x = \frac{168}{6}$$

$$\Rightarrow x = 28$$

$$\therefore \angle A = (3 \times 28 - 4)^\circ$$

$$= (84 - 4)^\circ$$

$$= 80^\circ$$

$$\angle B = ((3 \times 28) + 16)^\circ$$

$$= (84 + 16)^\circ$$

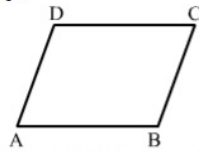
$$= 100^\circ$$

The opposite angles of a parallelogram are equal.

$$\therefore \angle C = \angle A = 80^\circ$$

$$\angle D = \angle B = 100^\circ$$

Q5



Let  $ABCD$  be a parallelogram and let the sum of its opposite angles be  $130^\circ$ .

$$\angle A + \angle C = 130^\circ$$

\*\*\*\*\* END \*\*\*\*\*