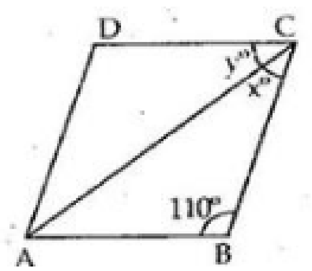
Exercise 9B

Question 9:

(i) ABCD is a rhombus, so its all sides are equal.




In $\Delta ABC$, we have

$$AB = BC$$

$$\Rightarrow \quad \angle CAB = \angle ACB = x^0$$

As, $\angle CAB + \angle ABC + \angle ACB = 180^0$

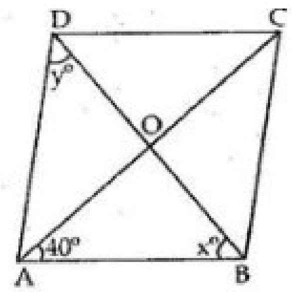
$$\Rightarrow \quad x + 110^0 + x = 180^0$$

$$\Rightarrow \quad 2x = 180^0 - 110^0 = 70^0$$

$$\Rightarrow \quad x = \frac{70^0}{2} = 35^0$$

$\therefore x = 35^0$ and $y = 35^0$

(ii) Since in a rhombus, all sides are equal




So in $\Delta ABD$, $AB = AD$

$\Rightarrow \angle ABD = \angle ADB$

$\Rightarrow x = y$ ......(1)

Now in $\Delta ABC$, $AB = BC$

$\Rightarrow \angle CAB = \angle ACB$

$\Rightarrow \angle ACB = 40^0$

$\therefore \angle B = 180^0 - \angle CAB - \angle ACB$

$= 180^0 - 40^0 - 40^0 = 100^0$

$\Rightarrow \angle DBC = \angle B - x^0 = 100 - x^0$

But $\angle DBC = \angle ADB = y^0$ [alternate angle]

$\Rightarrow 100 - x^0 = y^0$

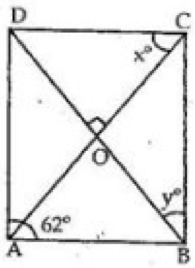
$\Rightarrow 100^0 - x^0 = x^0$ [from (1)]

$\Rightarrow 2x^0 = 100$

$\Rightarrow x^0 = \dfrac{100}{2} = 50^0$

So, $x = 50^0$ and $y = 50^0$.

(iii) Since ABCD is a rhombus




So, $\angle A = \angle C$, i.e. $\angle C = 62^0$

Now in $\Delta BCD$,

$BC = DC$

$\Rightarrow \angle CDB = \angle DBC = y^0$

As, $\angle BDC + \angle DBC + \angle BCD = 180^0$

$\Rightarrow y + y + 62^0 = 180^0$

$\Rightarrow 2y = 180^0 - 62^0 = 118^0$

$\Rightarrow y = \dfrac{118}{2} = 59^0$

As diagonals of a rhombus are perpendicular to each other,

$\Delta COD$ is a right triangle and $\angle DOC = 90^0, \angle ODC = y = 59^0$

$\Rightarrow \angle DCO = 90^0 - \angle ODC$

$= 90^0 - 59^0 = 31^0$

$\therefore \angle DCO = x = 31^0$

$\therefore$ $x = 31^0$ and $y = 59^0$

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