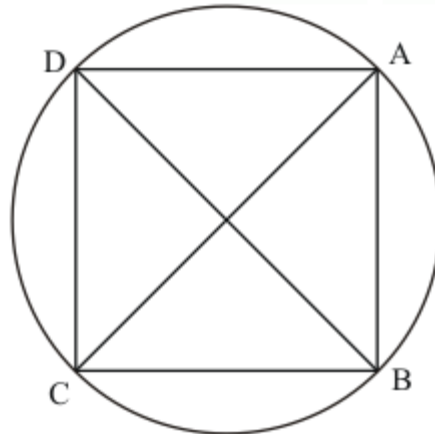




Circles Ex 16.5 Q18

Answer :

(i) It is given that $BC \parallel AD$, $\angle ADC = 110^\circ$ and $\angle BAC = 50^\circ$



We have to find $\angle DAC$

In cyclic quadrilateral

$$\angle A + \angle C = 180^\circ \dots\dots (1)$$

$$\angle B + \angle D = 180^\circ \dots\dots (2)$$

Since $\angle ADC = 110^\circ$

So

$$\begin{aligned}\angle B &= 180^\circ - \angle D \\ &= 180^\circ - 110^\circ \\ &= 70^\circ\end{aligned}$$

Therefore in $\triangle ABC$, $50^\circ + 70^\circ + \angle BCA = 180^\circ$

So $\angle BCA = 60^\circ \dots\dots (3)$

Now $\angle BCA = \angle CAD$ ($BC \parallel AD$ and AC is transversal)

$$\Rightarrow \angle BCA = \angle CAD = \boxed{60^\circ}$$

(ii) It is given that, $BC \parallel AD$, $\angle DBC = 80^\circ$ and $\angle BAC = 40^\circ$

We have to find $\angle BCD$

$$\angle BAC = \angle BDC = 40^\circ \text{ (Same segment)}$$

$$\begin{aligned}\angle DCB &= 180^\circ - (80^\circ + 40^\circ) \\ &= 180^\circ - 120^\circ \\ &= 60^\circ\end{aligned}$$

Hence $\angle BCD = \boxed{60^\circ}$

(iii) It is given that, $\angle BCD = 100^\circ$ and $\angle ABD = 70^\circ$

We have to find $\angle ABD$

Now

$$\angle A + \angle C = 180^\circ$$

$$\begin{aligned}\angle A &= 180^\circ - 100^\circ \\ &= 80^\circ\end{aligned}$$

In $\triangle ABD$ we have

$$\angle A + \angle ABD + \angle BDA = 180^\circ$$

$$\begin{aligned}\angle ADB &= 180^\circ - 150^\circ \\ &= 30^\circ\end{aligned}$$

Hence $\boxed{\angle ABD = 30^\circ}$

***** END *****