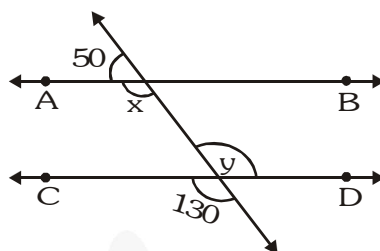


Ex - 6.2

Q1. In figure, find the values of x and y and then show that $AB \parallel CD$.



Sol. $x + 50 = 180^\circ$ (Linear pair of angles)

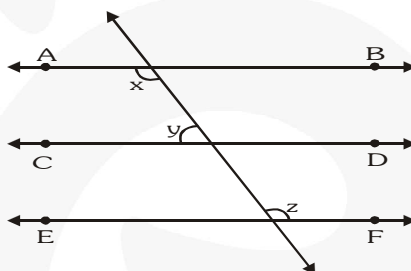
$$\Rightarrow x = 130^\circ$$

$y = 130^\circ$ (Vertically opposite angles)

Now, $x = y$ and the two angles form a pair of alternate angles made by a transversal intersecting the lines AB and CD

Therefore, $AB \parallel CD$.

Q2. In figure, if $AB \parallel CD$, $CD \parallel EF$ and $y : z = 3 : 7$, find x .



Sol. $AB \parallel CD$ and $CD \parallel EF$

$$\Rightarrow AB \parallel EF$$

$$\Rightarrow x = z \quad (\text{Alternate angles})$$

$$\text{Now, } x + y = 180^\circ$$

(Pair of interior angles on the same side of the transversal)

$$\Rightarrow z + y = 180^\circ \text{ i.e., } y + z = 180^\circ$$

Also, we are given that, $y : z = 3 : 7$

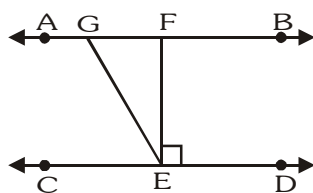
$$\text{Then, } y = \frac{3}{10} \times 180^\circ = 54^\circ$$

$$\text{and } z = \frac{7}{10} \times 180^\circ = 126^\circ$$

$$\text{We have } x = z = 126^\circ$$

$$\text{Therefore, } x = 126^\circ$$

Q3. In figure, if $AB \parallel CD$, $FE \perp CD$ and $\angle GED = 126^\circ$, find $\angle AGE$, $\angle GEF$ and $\angle FGE$.



Sol. $AB \parallel CD$

$$\angle AGE = \angle GED = 126^\circ$$

[given]

$$\Rightarrow \angle GEF + 90^\circ = 126^\circ$$

[Alternate angles]

$$\angle GEF = 36^\circ$$

$$\angle GEC + \angle GEF + \angle FED = 180^\circ$$

[Straight line]

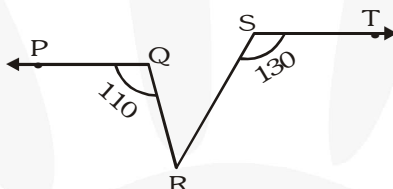
$$\angle GEC + 126^\circ = 180^\circ$$

$$\angle GEC = 180^\circ - 126^\circ = 54^\circ$$

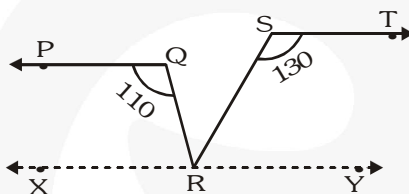
$$\angle FGE = \angle GEC = 54^\circ$$

[Alternate angles]

Q4. In figure, if $PQ \parallel ST$, $\angle PQR = 110^\circ$ and $\angle RST = 130^\circ$, find $\angle QRS$.



Sol. Through R, we draw $XRY \parallel PQ$.



$$\Rightarrow XRY \parallel ST \quad (\because PQ \parallel ST)$$

$$\angle QRX + 110^\circ = 180^\circ$$

$$\text{and } \angle YRS + 130^\circ = 180^\circ$$

$$\Rightarrow \angle QRX = 70^\circ$$

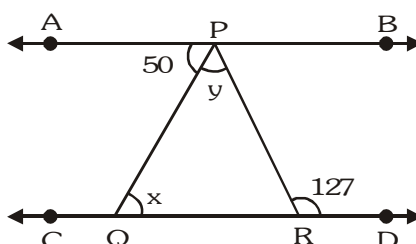
$$\text{and } \angle YRS = 50^\circ$$

$$\text{Now, } \angle QRX + \angle QRS + \angle YRS = 180^\circ$$

$$\Rightarrow 70^\circ + \angle QRS + 50^\circ = 180^\circ$$

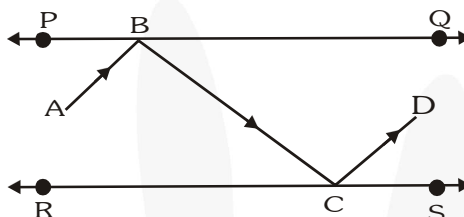
$$\Rightarrow \angle QRS = 60^\circ$$

Q5. In figure, if $AB \parallel CD$, $\angle APQ = 50^\circ$ and $\angle PRD = 127^\circ$, find x and y .

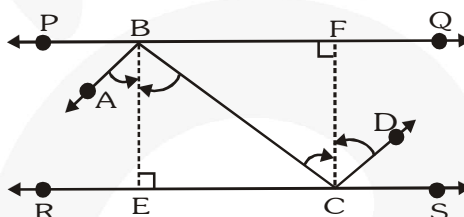


Sol. $AB \parallel CD$ [given]
 $x = \angle APQ = 50^\circ$ [Alternate angles]
 $\angle APQ + y = \angle PRD = 127^\circ$ [Alternate angles]
 $50^\circ + y = 127^\circ$
 $y = 127^\circ - 50^\circ = 77^\circ$

Q6. In figure, PQ and RS are two mirrors placed parallel to each other. An incident ray AB strikes the mirror PQ at B, the reflected ray moves along the path BC and strikes the mirror RS at C and again reflects back along CD. Prove that $AB \parallel CD$.



Sol. We draw $BE \perp RS$, then BE is also $\perp PQ$
 $(\because PQ \parallel RS)$
 We draw $CF \perp PQ$. Here, also $CF \perp RS$



Here, if we consider PQ as transversal intersecting lines BE and CF, then each pair of corresponding angles is equal. (each equal to 90°)

Thus, we have $BE \parallel CF$.

Now, $\angle ABE = \angle CBE$

(Angle of incidence = Angle of reflection)

$$\Rightarrow \angle ABE = \angle CBE = \frac{1}{2} \times \angle ABC \quad \dots(1)$$

$$\text{Similarly, } \angle BCF = \angle FCD = \frac{1}{2} \times \angle DCB \quad \dots(2)$$

Now, $BE \parallel CF$

$$\Rightarrow \angle CBE = \angle BCF \quad (\text{alternate angles})$$

$$\Rightarrow \frac{1}{2} \times \angle ABC = \frac{1}{2} \times \angle DCB \quad \{\text{by (1) and (2)}\}$$

$$\Rightarrow \angle ABC = \angle DCB$$

$$\Rightarrow AB \parallel CD$$