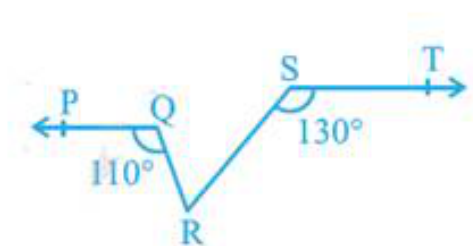




Exercise 6.2

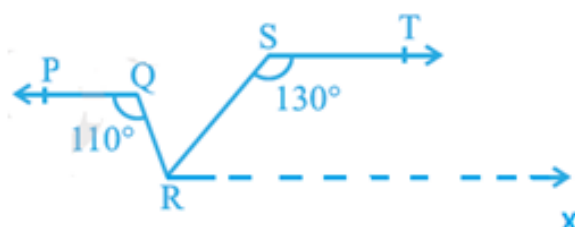
Q4. In the given figure, if $PQ \parallel ST$, $\angle PQR = 110^\circ$ and $\angle RST = 130^\circ$, find $\angle QRS$.

[Hint: Draw a line parallel to ST through point R .]



Ans. We are given that $PQ \parallel ST$, $\angle PQR = 110^\circ$ and $\angle RST = 130^\circ$.

We need to find the value of $\angle QRS$ in the figure.



We need to draw a line RX that is parallel to the line ST , to get

Thus, we have $ST \parallel RX$.

We know that lines parallel to the same line are also parallel to each other.

We can conclude that $PQ \parallel ST \parallel RX$.

$\angle PQR = \angle QRX$, or (Alternate interior angles)

$\angle QRX = 110^\circ$.

We know that angles on same side of a transversal are supplementary.

$\angle RST + \angle SRX = 180^\circ \Rightarrow 130^\circ + \angle SRX = 180^\circ$

$$\Rightarrow \angle SRX = 180^\circ - 130^\circ = 50^\circ.$$

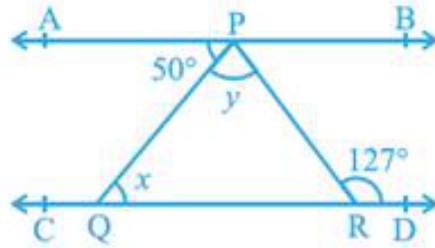
From the figure, we can conclude that

$$\angle QRX = \angle SRX + \angle QRS \Rightarrow 110^\circ = 50^\circ + \angle QRS$$

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

Therefore, we can conclude that $\angle QRS = 60^\circ$.

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



Ans. We are given that $AB \parallel CD$, $\angle APQ = 50^\circ$ and $\angle PRD = 127^\circ$.

We need to find the value of x and y in the figure.

$$\angle APQ = x = 50^\circ. \text{ (Alternate interior angles)}$$

$$\angle PRD = \angle APR = 127^\circ. \text{ (Alternate interior angles)}$$

$$\angle APR = \angle QPR + \angle APQ.$$

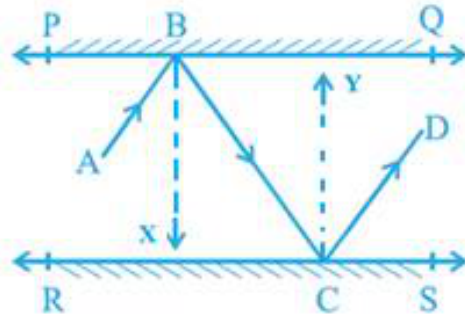
$$127^\circ = y + 50^\circ \Rightarrow y = 77^\circ.$$

Therefore, we can conclude that

$$x = 50^\circ \text{ and } y = 77^\circ.$$

Q6. In the given 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 $AB \parallel CD$.

Ans. We are given that PQ and RS are two mirrors that are parallel to each other.



We need to prove that $AB \parallel CD$ in the figure.

Let us draw lines BX and CY that are parallel to each other, to get

We know that according to the laws of reflection

$$\angle ABX = \angle CBX \text{ and } \angle BCY = \angle DCY .$$

$$\angle BCY = \angle CBX \text{ (Alternate interior angles)}$$

We can conclude that

$$\angle ABX = \angle CBX = \angle BCY = \angle DCY .$$

From the figure, we can conclude that

$$\angle ABC = \angle ABX + \angle CBX, \text{ and}$$

$$\angle DCB = \angle BCY + \angle DCY .$$

Therefore, we can conclude that $\angle ABC = \angle DCB$.

From the figure, we can conclude that

$\angle ABC$ and $\angle DCB$ form a pair of alternate interior angles corresponding to the lines AB and CD , and transversal BC .

Therefore, we can conclude that $AB \parallel CD$

***** END *****