

CHAPTER 06

Lines and Angles

Co-interior angles theorem and its converse:

- If a transversal intersects two parallel lines, then each pair of interior angles on the same side of the transversal is supplementary. In other words, co – interior angles are supplementary.

Hence,

$$(i) \angle 3 + \angle 6 = 180^\circ$$

$$(ii) \angle 4 + \angle 5 = 180^\circ$$

- If a transversal intersects two lines such that a pair of co-interior angles are supplementary, then the two lines are parallel.

Co-exterior angles theorem and its converse:

- If a transversal intersects two parallel lines, then each pair of co-exterior angles are supplementary.

Hence,

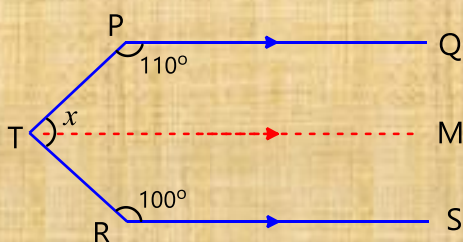
$$i) \angle 1 + \angle 8 = 180^\circ$$

$$ii) \angle 2 + \angle 7 = 180^\circ$$

- If a transversal intersects two lines such that a pair of co – exterior angles are supplementary, then two lines are parallel.

Example:

Find the angle 'x' in the adjoining diagram.

**Sol.**

Through T, draw $TM \parallel PQ$

$$\angle QPT + \angle PTM = 180^\circ$$

(Co-interior angles are supplementary, $\therefore PQ \parallel TM$ & PT is the transversal)

$$\angle PTM = 180^\circ - \angle QPT = 180^\circ - 110^\circ = 70^\circ \dots\dots\dots (1)$$

$$\text{Similarly, } \angle MTR + \angle TRS = 180^\circ$$

(Co-interior angles are supplementary, $\therefore TM \parallel RS$ & TR is the transversal)

$$\angle MTR = 180^\circ - \angle TRS = 180^\circ - 100^\circ = 80^\circ \dots\dots\dots (2)$$

$$\therefore x = \angle PTM + \angle MTR$$

$$x = 70^\circ + 80^\circ (\because \text{from (1) \& (2)})$$

$$x = 150^\circ$$

