

CHAPTER 06

Lines and Angles

Alternate interior angles theorem and its converse:

- If a transversal intersects two parallel lines, then each pair of alternate interior angles are equal.

Hence,

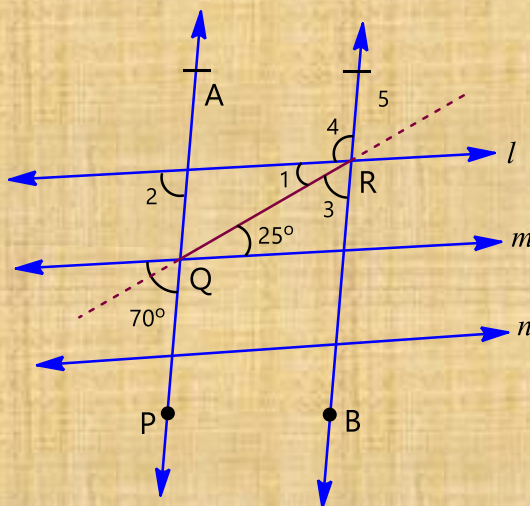
$$\text{I) } \angle 3 = \angle 5$$

$$\text{II) } \angle 4 = \angle 6$$

- If a transversal intersect two lines such that a pair of alternate interior angles are equal, then the two lines are parallel.

Example:

If $l \parallel m \parallel n$ and $PQ \parallel RS$, find $\angle QRS$.



Sol.

Extend QP to point A and SR to point B.

$$l \parallel m \Rightarrow \angle 1 = 25^\circ \text{ (Alternate interior angles)}$$

(And)

$$\angle 2 = 70^\circ \text{ (Corresponding angles)}$$

$$\text{Also, } \angle 3 = \angle 2 \text{ (AP } \parallel \text{ SB, corresponding angles)}$$

$$\Rightarrow \angle 3 = 70^\circ$$

Now,

$$\angle 3 + \angle 4 = 180^\circ \text{ (Linear pair)}$$

$$\Rightarrow 70^\circ + \angle 4 = 180^\circ$$

$$\Rightarrow \angle 4 = 180^\circ - 70^\circ = 110^\circ$$

$$\therefore \angle QRS = \angle 1 + \angle 4 = 25^\circ + 110^\circ = 135^\circ$$