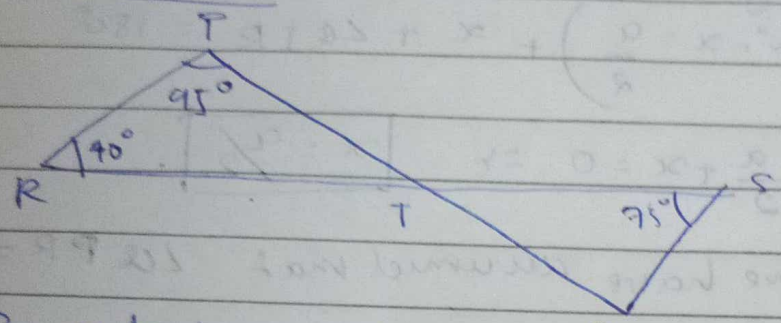
Exercise- 6.3

Q4)



By exterior angle property of triangle

$\angle PTS = 135°$, so, $\angle STQ = 180° - 135° = 45°$.

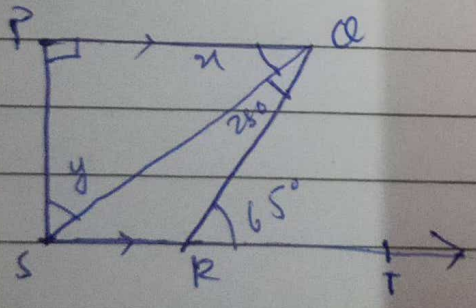
So, By angle sum property of triangle

$\angle STQ + \angle SQT + 75° = 180°$

$\Rightarrow 45° + \angle SQT + 75° = 180°$

$\Rightarrow \angle SQT = 180° - 120° = \boxed{60°}$.

Q5)



By exterior angle property

$\angle QSR + 25° = 65°$

$\Rightarrow \angle QSR = 37°$

and Now as $PQ \parallel SR$ sum of interior angles of the same side of transversal is equal to $180°$

So, $90 + y + 37° = 180°$

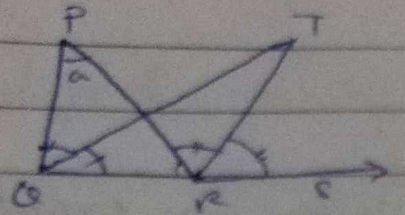
$\Rightarrow y = 180° - 127° = \boxed{53°}$

and now by angle sum property

$53° + 90° + x = 180° \Rightarrow x = 180° - 143°$

$= \boxed{37°}$

Q6)



Let $\angle P = a$ and $\angle TQR = x$

So, $\angle PQR = 2x$,

and according to a exterior angle property

$a + 2x = 2b$ $\quad (b = \angle PRT)$.

$\Rightarrow b = \frac{a}{2} + x$. so, $\angle TRQ = 180^\circ - x - \frac{a}{2}$.

$\angle TQR = x$, $\angle QTR = ?$.

according to angle sum property

$$\left(180^\circ - x - \frac{a}{2}\right) + x + \angle QTR = 180^\circ$$

$$\Rightarrow -\frac{a}{2} + x = 0 \Rightarrow \boxed{x = a/2}.$$

and previously we have assumed that $\angle QPR = a$

So, proved that $\angle QTR = \frac{1}{2} \angle QPR$.