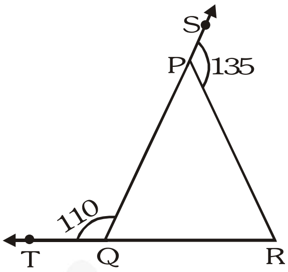
Ex - 6.3

Q1. In figure, sides QP and RQ of ΔPQR are produced to points S and T respectively. If $\angle SPR = 135°$ and $\angle PQT = 110°$, find $\angle PRQ$.



Sol. $\angle QPR + 135° = 180°$

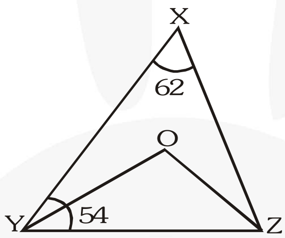
$\Rightarrow \angle QPR = 45°$

Now, $\angle QRP + \angle QPR = \angle PQT$

$\Rightarrow \angle QRP + 45° = 110°$

$\Rightarrow \angle QRP = 65°$

Q2. In figure, $\angle X = 62°$, $\angle XYZ = 54°$. If YO and ZO are the bisectors of $\angle XYZ$ and $\angle XZY$ respectively of ΔXYZ, find $\angle OZY$ and $\angle YOZ$.



Sol. In ΔXYZ

$\angle XYZ + \angle YZX + \angle ZXY = 180°$

$54° + \angle YZX + 62° = 180°$

$\Rightarrow \angle YZX = 64°$

$\because$ YO is bisector $\Rightarrow \angle XYO = \angle OYZ = \frac{54°}{2} = 27°$

ZO is bisector $\Rightarrow \angle XZO = \angle OZY = \frac{64°}{2} = 32°$

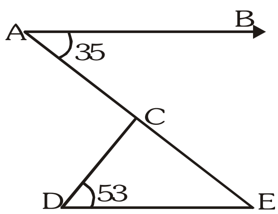
In ΔOYZ

$\angle OYZ + \angle OZY + \angle YOZ = 180°$

$27° + 32° + \angle YOZ = 180°$

$\Rightarrow \angle YOZ = 121°$

Q3. In figure, if AB || DE, $\angle BAC = 35°$ and $\angle CDE = 53°$, find $\angle DCE$.



Sol. AB|| DE (given)

∠DEC = ∠BAC = 35° (Alternate angles)

∠CDE = 53°

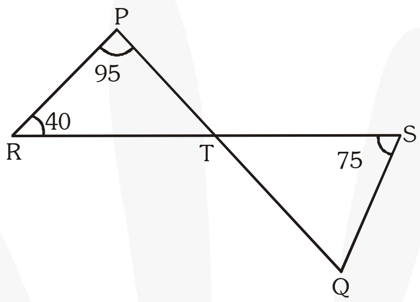
In Δ CDE

∠CDE + ∠DEC + ∠DCE = 180°

53° + 35° + ∠DCE = 180°

∠DCE = 180° – 88° = 92°

Q4. In figure, if lines PQ and RS intersect at point T, such that ∠PRT = 40°, ∠RPT = 95¯ and ∠TSQ = 75°, find ∠SQT.



Sol. In ΔPRT

∠PTR + ∠PRT + ∠RPT = 180°

∠PTR + 40° + 95° = 180°

∠PTR = 45°

∠QTS = ∠PTR = 45° [Vertically opposite angles]

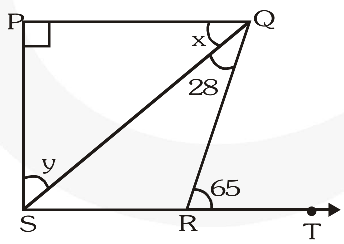
In ΔTSQ

∠QTS + ∠TSQ + ∠SQT = 180°

45° + 75° + ∠SQT = 180°

∠SQT = 60°

Q5. In figure, if PQ ⊥ PS, PQ || SR, ∠SQR = 28° and ∠QRT = 65°, then find the value of x and y.



Sol. ∠QSR = x (alternate angles)

Now, ∠QSR + 28° = 65°

⇒ x + 28° = 65°

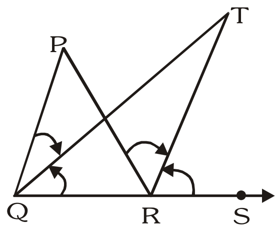
⇒ x = 37°

In ΔPQS, 90° + x + y = 180°

⇒ 90° + 37° + y = 180°

⇒ y = 53°

Q6. In figure, the side QR of ΔPQR is produced to a point S. If the bisectors of $\angle PQR$ and $\angle PRS$ meet at point T, then prove that $\angle QTR = \frac{1}{2}\angle QPR$.



Sol. $\angle PRS = \angle PQR + \angle QPR$ ...(1)

Now, $\angle QTR + \angle TQR = \angle TRS$

$\Rightarrow \angle QTR + \frac{1}{2} \times \angle PQR = \frac{1}{2}\angle PRS$

$\Rightarrow 2\angle QTR + \angle PQR = \angle PRS$ ...(2)

From (1) and (2),

$2\angle QRT + \angle PQR = \angle PQR + \angle QPR$

$\Rightarrow 2\angle QTR = \angle QPR$

$\Rightarrow \angle QTR = \frac{1}{2}\angle QPR$