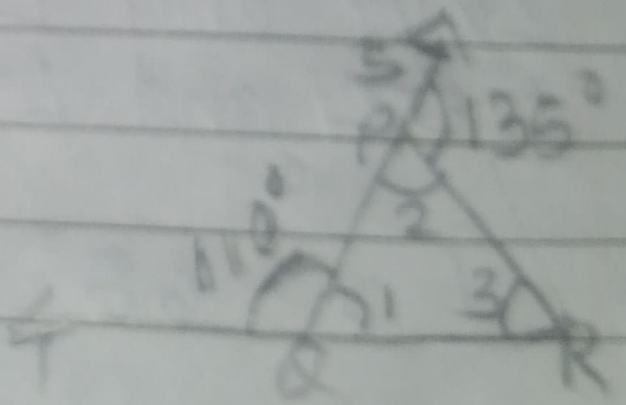
Exercise 6.3

1) In figure 6.39, sides QP and RQ of $\triangle PQR$ are produced to points S and T respectively. If $\angle SPR = 135°$ and $\angle PQT = 110°$, find $\angle PRQ$.



$\angle SPR = 135°$

$\angle PQT = 110°$

$\angle PRQ = ?$

$\angle 1 = 180° - 110°$ (Linear Pair)

$\rightarrow 70°$

$\angle 2 = 180° - 135°$ (Linear pair)

$\rightarrow 45°$

$\angle 3 = \angle 1 + \angle 2 + \angle 3 = 180^\circ$ (Angle sum property)

$= 70^\circ + 45^\circ + \angle 3 = 180^\circ$

$\Rightarrow 115^\circ + x = 180^\circ$

$x = 180^\circ - 115^\circ$

$x = 65^\circ$

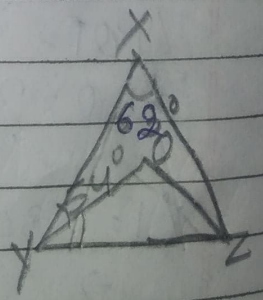
$\angle PQR = 180^\circ$

$\angle R = 70^\circ$

$\angle P = 45^\circ$

$\angle R = 65^\circ$

2) In figure 6.40, $\angle X = 62^\circ$, $\angle XYZ = 54^\circ$, If YO and ZO are the bisectors of $\angle XYZ$ and $\angle XZY$ respectively of $\triangle XYZ$, find $\angle OZY$ and $\angle YOZ$.



$\Rightarrow \angle x = 62^\circ$

$\angle y = 54^\circ$

$\angle OZY = ?$ $\angle YOZ = ?$

$54^\circ + 62^\circ + z = 180^\circ$ (Angle sum Property)

$116^\circ + z = 180^\circ$

$z = 180^\circ - 116^\circ = 64^\circ$

$\angle z = 64^\circ$ for $(\angle xyz)$

then for $(\angle ozy) = \frac{64}{2} = 32^\circ$

∴ The value of $\angle ozy = 32^\circ$

$\angle y = 54^\circ$ for $(\angle xyz)$

then for $(\angle yoz) = \frac{54}{2} = 27^\circ$

$27^\circ + 32^\circ + O = 180^\circ$ (Angle sum property)

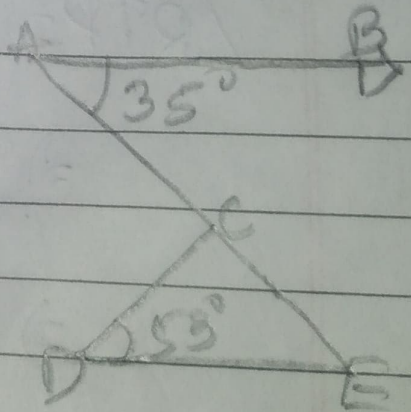
$59^\circ + O = 180^\circ$

$O = 180^\circ - 59^\circ$

$O = 121^\circ$

∴ Then the value of $\angle yoz = 121^\circ$

3) In Fig. 6.41, if AB || DE, $\angle BAC = 35^\circ$ and $\angle CDE = 53^\circ$, find $\angle DCE$.



⇒ For $\angle BAC = \angle A = 35^\circ$

For $\angle CDE = \angle D = 53^\circ$

For $\angle DCE = \angle C = ? \rightarrow 92^\circ$

$53^\circ + 35^\circ + \angle ACD = 180^\circ$ (Angle sum property)

$\therefore 88^\circ + \angle ACD = 180^\circ$

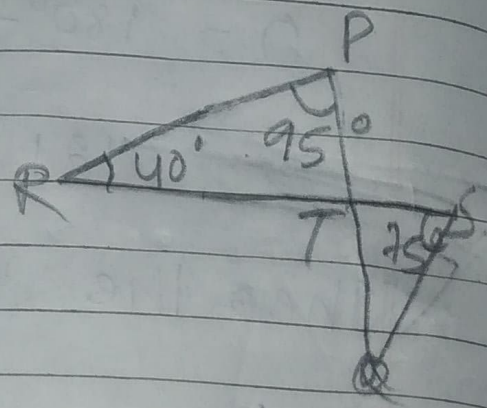
$\angle ACD = 180^\circ - 88^\circ$

$\angle ACD = 92^\circ$

For $\angle ACD = \angle C = 92^\circ$

Like that for $\angle DCE = \angle C = 92^\circ$

4) In fig. 6.42, if lines PQ and RS intersect at point T, such that $\angle PRT = 40^\circ$, $\angle RPT = 95^\circ$ and $\angle TSQ = 75^\circ$, find $\angle SQT$.



$\angle PRT = 40^\circ$

$\angle RPT = 95^\circ$

$\angle TSQ = 75^\circ$

$\angle SQT = ?$

$\angle RTP = \angle R + \angle P + \angle T = 180^\circ$ (Angle sum property)

$\Rightarrow 40^\circ + 95^\circ + \angle T = 180^\circ$

$\Rightarrow 135^\circ + \angle T = 180^\circ$

$\Rightarrow \angle T = 180^\circ - 135^\circ$

$\Rightarrow \angle T = 45^\circ$

In $\triangle RTP$, $\angle T = 45°$

then in $\triangle SQT$, $\angle T = 45°$ (vertically opposite angles)

$\angle SQT + \angle S + \angle Q + \angle T = 180°$ (angle sum property)

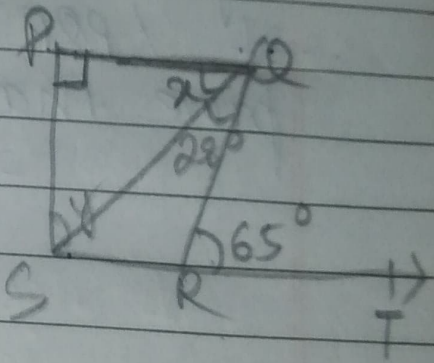
$\Rightarrow 75° + \angle Q + 45° = 180°$

$\Rightarrow 120° + \angle Q = 180°$

$\Rightarrow \angle Q = 180° - 120°$

$\Rightarrow \angle Q = 60°$

(5) In fig 6.43, if $PQ \perp PS$, $PQ \parallel SR$, $\angle SQR = x°$ and $\angle QRT = 65°$, then find the values of x and y.



$\Rightarrow \angle SQR = 28°$

$\angle QRT = 65°$

$\angle QSR = ?$ $\rightarrow \angle R = 180° - 65°$ (Linear pair)

$\rightarrow \angle R = 115°$

$28° + 115° + \angle S = 180°$

$43° + \angle S = 180°$ (Angle sum property)

$\angle S = 180° - 43°$

$\therefore \angle S = 37°$

$\angle S = \angle y \quad \therefore y = 37°$

$\angle PQS = ?$

$90^\circ + x + 37^\circ = 180^\circ$ (Angle sum property)

$\rightarrow 127^\circ + x = 180^\circ$

$\rightarrow x = 180^\circ - 127^\circ$

$x = 53^\circ$

2. $y = 37^\circ$

$x = 53^\circ$