Date ______
Page ______

HW
29/06/2021

Exercise 6.3

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

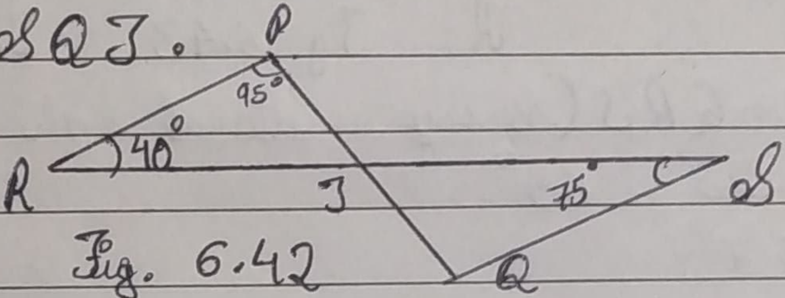

Fig. 6.42

ans) Consider triangle PRT.
$PRT + RPT + PTR = 180^\circ$
So, $PTR = 45^\circ$
Now PTR will be equal to STQ as they are vertically opposite angles.
So, $PTR = STQ = 45^\circ$
Again, in triangle STQ.
$TSQ + PTR + SQT = 180^\circ$
So, $SQT = 60^\circ$

5) In Fig. 6.43, if $PQ \perp PS$, $PQ \parallel SR$, $\angle SQR = 28^\circ$ and $\angle QRT = 65^\circ$, then find the values of x and y.

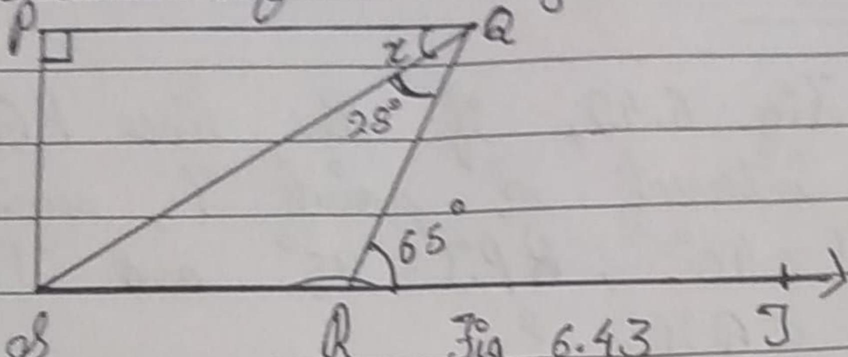

Fig 6.43

ans) $x + SQR = QRT$ (As they are alternate angles since QR is transversal)
So, $x + 28^\circ = 65^\circ$
$\therefore x = 37^\circ$
It is also known that alternate interior angles are same
So, $QRS = x = 37^\circ$
Also, Now,
$QRS + QRT = 180^\circ$ (As they are a linear pair)
Or, $QRS + 65^\circ = 180^\circ$
$\therefore QRS = 115^\circ$
Now, we know that the sum of the angles in a quadrilateral is 360°. So, ~~PQR~~ $R + P + Q + S = 360^\circ$
Putting their respective values, we get,
$S = 360^\circ - 90^\circ - 65^\circ - 115^\circ$
In ΔSPQ
$\angle SPQ + x + y = 180^\circ$
$90^\circ + 37^\circ + y = 180^\circ$
$y = 180^\circ - 127^\circ = 53^\circ$
$\therefore y = 53^\circ$

6) In Fig. 6.44, the side of $\triangle PQR$ is produced to a point S. If the bisectors of PQR and PRS meet at point J, then prove that $QJR = \frac{1}{2} QPR$

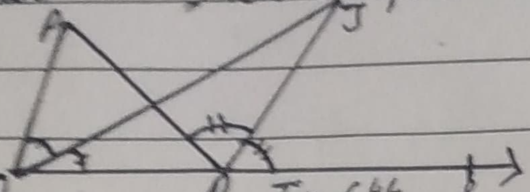

Fig. 6.44

ans) Consider the $\triangle PQR$. PRS is the exterior angle and QPR and PQR are interior angles.

So, $PRS = QPR + PQR$ (according to the triangle prop)

Or, $PRS - PQR = QRP$ ---- (i)

Now, consider the $\triangle QRJ$,

~~QJR~~ $JRS = JQR + QJR$

Or, $QJR = JRS - JQR$

We know that QJ and RJ bisects PQR and PRS respectively.

So $PRS = 2JRS$ and $PQR = 2JQR$

Now, $QJR = \frac{1}{2} PRS - \frac{1}{2} PQR$

Or, $QJR = \frac{1}{2}(PRS - PQR)$

From (i) we know that $PRS - PQR = QPR$

So, $QJR = \frac{1}{2} QPR$ (hence proved)