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5. In Fig. 6.43, if PQ ⊥ PS, PQ SR, SQR = 28° and QRT = 65°, then find the values of x and y.

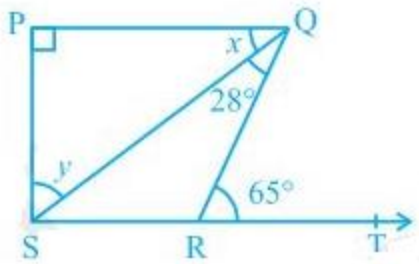

Fig. 6.43

Solution:

x +SQR = QRT (As they are alternate angles since QR is transversal)

So, x+28° = 65°

∴ x = 37°

It is also known that alternate interior angles are same and so,

QSR = x = 37°

Also, Now,

QRS +QRT = 180° (As they are a Linear pair)

Or, QRS+65° = 180°

So, QRS = 115°

Now, we know that the sum of the angles in a quadrilateral is 360°. So,

P +Q+R+S = 360°

Putting their respective values, we get,

S = 360°-90°-65°-115°

In Δ SPQ

$\angle SPQ + x + y = 180^0$

$90^0 + 37^0 + y = 180^0$

$y = 180^0 - 127^0 = 53^0$

Hence, y = 53°

6. In Fig. 6.44, the side QR of ΔPQR is produced to a point S. If the bisectors of PQR and PRS meet at point T, then prove that QTR = ½ QPR.

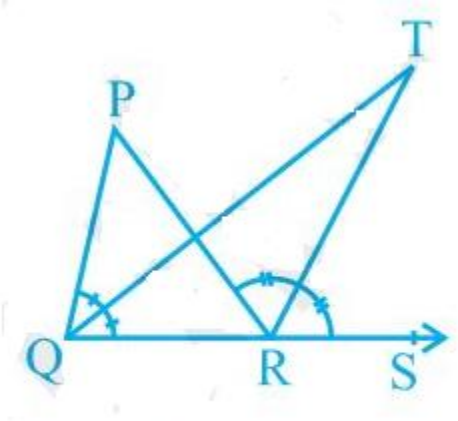

Fig. 6.44

Solution:

Consider the ΔPQR. PRS is the exterior angle and QPR and PQR are interior angles.

So, PRS = QPR+PQR (According to triangle property)

Or, PRS -PQR = QPR ————(i)

Now, consider the ΔQRT,

TRS = TQR+QTR

Or, QTR = TRS-TQR

We know that QT and RT bisect PQR and PRS respectively.

So, PRS = 2 TRS and PQR = 2TQR

Now, QTR = ½ PRS – ½PQR

Or, QTR = ½ (PRS -PQR)

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

So, QTR = ½ QPR (hence