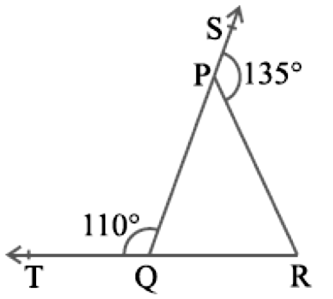
NCERT Solutions for Class 9 Maths Chapter 6 Lines and Angles Ex 6.3

Question 1.

In figure, sides QP and RQ of Δ PQR are produced to points S and T respectively. If ∠ SPR = 135° and ∠ PQT = 110°, find ∠ PRQ.



Solution.

It is given in the question that:

$\angle SPR = 135^O$

And,

$\angle PQT = 110^o$

Now, according to the question,

$\angle SPR + \angle QPR = 180^O$ (SQ is a straight line)

$135^o + \angle QPR = 180^O$

$\angle QPR = 45^O$

And,

$\angle PQT + \angle PQR = 180^O$ (TR is a straight line)

$110^o + \angle PQR = 180^O$

$\angle PQR = 70^O$

Now,

$\angle PQR + \angle QPR + \angle PRQ = 180^O$ (Sum of the interior angles of the triangle)

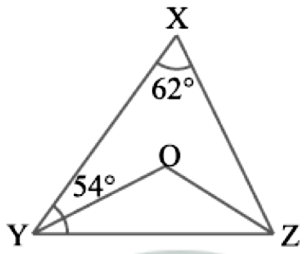
$70^o + 45^o + \angle PRQ = 180^O$

$115^O + \angle PRQ = 180^O$

$\angle PRQ = 65^O$

Question 2.

In figure, ∠ X = 62°, ∠ XYZ = 54°. If YO and ZO are the bisectors of ∠ XYZ and∠ XZY respectively of Δ XYZ, find ∠ OZY and ∠ YOZ.



Solution.

It is given in the question that:

$\angle X = 62^o$, $\angle XYZ = 54^o$

YO and ZO are the bisectors of ∠XYZ and ∠XZY respectively.

Now, according to the question,

$\angle X + \angle XYZ + \angle XZY = 180^o$ (Sum of the interior angles of triangle)

$62^o + 54^o + \angle XZY = 180^o$

$116^o + \angle XZY = 180^o$

$\angle XZY = 64^o$

Now,

$\angle OZY = \frac{1}{2}\angle XZY\ (ZO\ is\ the\ bisector)$

$\angle OZY = 32^o$

And,

$\angle OYZ = \frac{1}{2}\angle XYZ$ (YO is the bisector)

∠OYZ = 27°

Now,

∠OZY + ∠OYZ + ∠O = 180° (Sum of the interior angles of the triangle)

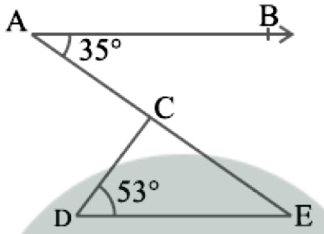
32° + 27° + ∠O = 180°

59° + ∠O = 180°

∠O = 121°

Question 3.

In figure if AB || DE, ∠ BAC = 35° and ∠ CDE = 53°, find ∠ DCE.



Solution.

It is given in the question that:

AB parallel DE,

∠BAC = 35°

And,

∠CDE = 53°

According to question,

∠BAC = ∠CED (Alternate interior angles)

Therefore,

∠CED = 35°

Now,

∠DCE + ∠CED + ∠CDE = 180° (Sum of the interior angles of the triangle)

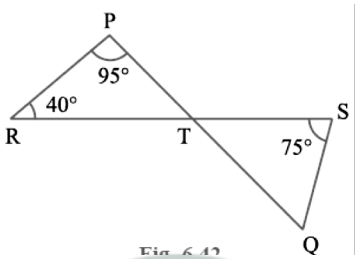
$\angle DCE + 35^o + 53^o = 180^o$

$\angle DCE + 88^o = 180^o$

$\angle DCE = 92^o$

Question 4.

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



Solution.

It is given in the question that:

$\angle PRT = 40^o$

$\angle RPT = 95^o$ and,

$\angle TSQ = 75^o$

Now according to the question,

$\angle PRT + \angle RPT + \angle PTR = 180^o$ (Sum of interior angles of the triangle)

$40^o + 95^o + \angle PTR = 180^o$

$40^o + 95^o + \angle PTR = 180^o$

$135^o + \angle PTR = 180^o$

$\angle PTR = 45^o$

$\angle PTR = \angle STQ = 45^o$ (Vertically opposite angles)

Now,

$\angle TSQ + \angle PTR + \angle SQT = 180^o$ (Sum of the interior angles of the triangle)

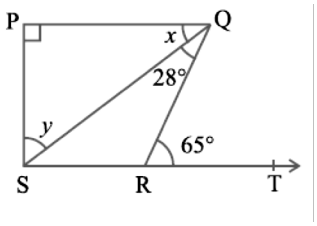
$75^o + 45^o + \angle SQT = 180^o$

$120^o + \angle SQT = 180^o$

$\angle SQT = 60^o$

Question 5.

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



Solution.

It is given in the question that:

PQ is perpendicular to PS

PQ parallel SR

$\angle SQR = 28^o$

And,

$\angle QRT = 65^o$

Now according to the question,

$x + \angle SQR = \angle QRT$ (Alternate angles as QR is transversal)

$x + 28^o = 65^o$

$x = 37^o$

Also,

$\angle QSR = x$

$\angle QSR = 37^o$

Also,

∠QRS + ∠QRT = 180° (Linear pair)

∠QRS + 65° = 180°

∠QRS = 115°

Now,

∠P + ∠Q + ∠R + ∠S = 360° (Sum of the angles in a quadrilateral)

90° + 65^0 + 115° + ∠S = 360°

270° + y + ∠QSR = 360°

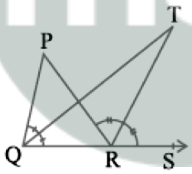
270° + y + 37° = 360°

307° + y = 360°

y = 53°

Question 6.

In figure the side QR of Δ PQR is produced to a point S. If the bisectors of ∠ PQR and∠ PRS meet at point T, then prove that∠ QTR = 1/2 ∠ QPR.



Solution.

It is given in the question that:

Bisectors of ∠PQR and ∠PRS meet at point T

To prove,

∠QTR = $\frac{1}{2}\angle QPR$

Proof: ∠TRS = ∠TQR + ∠QTR (Exterior angle of a triangle equals to the sum of the two opposite interior angles)

∠QTR = ∠TRS - ∠TQR (i)

Also,

∠SRP = ∠QPR + ∠PQR

2∠TRS = ∠QPR + 2∠TQR

∠QPR = 2∠TRS - 2∠TQR

$\frac{1}{2}\angle QPR$ = ∠TRS - ∠TQR

From (i) and (ii), we get

∠QTR - ∠TQR = $\frac{1}{2}\angle QPR$

Hence, proved