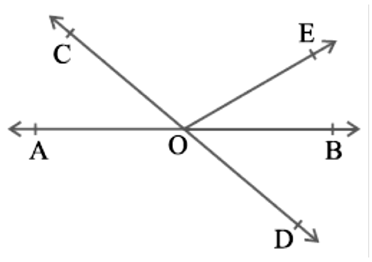
NCERT Solutions for Class 9 Maths Chapter 6 Lines and Angles Ex 6.1

Question 1.

In given figure lines AB and CD intersect at O. If$\angle$ AOC + $\angle$ BOE = 70° and $\angle$ BOD = 40°, find$\angle$ BOE and reflex $\angle$ COE.



Solution.

It is given in the question that:

$\angle AOC + \angle BOE = 70^{O}$

And,

$\angle BOD = 40^{O}$

Now, according to the question,

$\angle AOC + \angle BOE + \angle COE = 180^{O}$ (Straight Line)

$70^{o} + \angle COE = 180^{O}$

$\angle COE = 110^{O}$

And,

$\angle COE + \angle BOD + \angle BOE = 180^{O}$ (Straight Line)

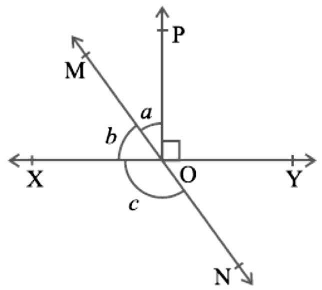
$110^{o} + 40^{o} + \angle BOE = 180^{O}$

$150^{O} + \angle BOE = 180^{O}$

$\angle BOE = 30^{O}$

Question 2.

In given figure lines XY and MN intersect at O. If$\angle$ POY = 90° and a: b = 2 : 3, find c.



Solution.

It is given in the question that:

$\angle POY = 90^O$

And,

a : b = 2 : 3

Now, according to the question,

$\angle POY + a + b = 180^o$

$90^o + a + b = 180^o$

$a + b = 90^o$

Let a be 2x and b as 3x

$2x + 3x = 90^o$

$5x = 90^o$

$x = 18^o$

Hence,

$a = 2 * 18^o = 36^o$

And,

$b = 3 * 18^o = 54^o$

And,

$b + c = 180^o$ (Linear pair)

$54^o + c = 180^o$

c = 126°

Question 3.

In Figure ∠ PQR = ∠ PRQ, then prove that ∠PQS = ∠ PRT.

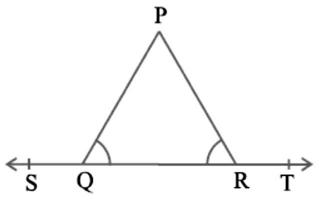


Fig. 6.15

Solution.

It is given in the question that:

∠PQR = ∠PRQ

To prove,

∠PQS = ∠PRT

Now, according to the question,

∠PQR + ∠PQS = 180° (Linear pair)

∠PQS = 180° - ∠PQR (i)

And,

∠PRQ + ∠PRT = 180° (Linear pair)

∠PRT = 180° - ∠PRQ

∠PRQ = 180° - ∠PQR (ii)

Using (i) and (ii), we get

∠PQS = ∠PRT = 180° - ∠PQR

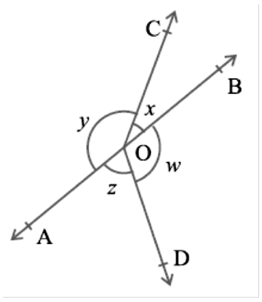
Therefore,

∠PQS = ∠PRT

Hence, proved

Question 4.

In figure, if x + y = w + z, then prove that AOB is a line.



Solution.

It is given in the question that:

x + y = w + z

To prove,

AOB is a line or x + y = 180° (Linear pair)

Now, according to the question,

x + y + w + z = 360° (Angles at a point)

(x + y) + (w + z) = 360°

(x + y) + (x + y) = 360° (Given, x + y = w + z)

2 (x + y) = 360°

(x + y) = 180°

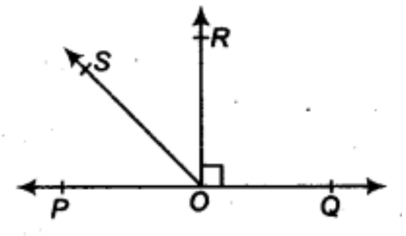
Therefore, x + y makes a linear pair.

And, AOB is a straight line

Question 5.

In figure, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that

$$\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$$



Solution.

rara POQ is a straight line. [Given]
∴ ∠POS + ∠ROS + ∠ROQ = 180°
But OR ⊥ PQ
∴ ∠ROQ = 90°
⇒ ∠POS + ∠ROS + 90° = 180°
⇒ ∠POS + ∠ROS = 90°
⇒ ∠ROS = 90° – ∠POS … (1)
Now, we have ∠ROS + ∠ROQ = ∠QOS
⇒ ∠ROS + 90° = ∠QOS
⇒ ∠ROS = ∠QOS – 90° ……(2)
Adding (1) and (2), we have
2 ∠ROS = (∠QOS – ∠POS)
∴ ∠ROS = 1/2($\angle QOS - \angle POS$)

Question 6.

It is given that ∠ XYZ = 64° and XY is produced to point P. Draw a figure from the given information. If ray YQ bisects ∠ ZYP, find ∠ XYQ and reflex ∠ QYP.

Solution.

It is given in the question that:

∠XYZ = 64°

YQ bisects ∠ZYP

∠XYZ + ∠ZYP = 180° (Linear pair)

$64^o + \angle ZYP = 180^o$

$\angle ZYP = 116^o$

And,

$\angle ZYP = \angle ZYQ + \angle QYP$

$\angle ZYQ = \angle QYP$ (YQ bisects $\angle ZYP$)

$\angle ZYP = 2\angle ZYQ$

$2\angle ZYQ = 116^o$

$\angle ZYQ = 58^o = \angle QYP$

Now,

$\angle XYQ = \angle XYZ + \angle ZYQ$

$\angle XYQ = 64^o + 58^o$

$\angle XYQ = 122^o$

And,

Reflex of $\angle QYP = 180^o + \angle XYQ$

$\angle QYP = 180^o + 122^o$

$\angle QYP = 302^o$