



SpeedLabs

MATHS

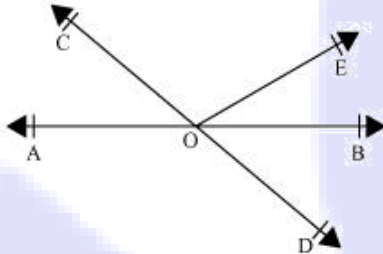
CBSE 9th

TEEVRA EDUTECH PVT. LTD.

LINES AND ANGLES

Exercise- 6.1

Q.1 In Fig. 6.13, lines AB and CD intersect at O. If $\angle AOC + \angle BOE = 70^\circ$ and, $\angle BOD = 40^\circ$ find $\angle BOE$ and reflex $\angle COE$.



Ans. We are given that $\angle AOC + \angle BOE = 70^\circ$ and $\angle BOD = 40^\circ$. $\angle BOE$ and $\angle COE$ form a linear pair. We know that sum of the angles of a linear pair is 180° .

$$\therefore \angle COB + \angle COE = 180^\circ$$

$$\therefore \angle COB = \angle AOC + \angle BOE \text{ "or"}$$

$$\therefore \angle AOC + \angle BOE + \angle COE = 180^\circ$$

$$\Rightarrow 70^\circ + \angle COE = 180^\circ$$

$$\Rightarrow \angle COE = 180^\circ - 70^\circ = 110^\circ$$

$$\angle COE = 360^\circ - \angle COE$$

$$360^\circ - 110^\circ = 250^\circ$$

$$\angle AOC = \angle BOD \text{ or}$$

$$\angle BOD + \angle BOE = 70^\circ$$

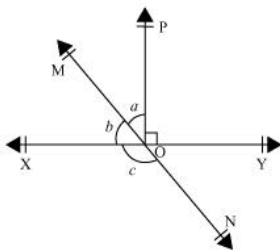
But, we are given that

$$\angle BOD = 40^\circ$$

$$40^\circ + \angle BOE = 70^\circ - 40^\circ = 30^\circ$$

Therefore, we can conclude that $\angle COE = 250^\circ$ and $\angle BOE = 30^\circ$

Q.2 In Fig. 6.14, lines XY and MN intersect at O. If $\angle POY$ and $a:b = 2:3$, find c.



Ans. We are given that $\angle POY = 90^\circ$ and $a : b = 2:3$ "We need find the value of c in the given figure. Let a be equal to $2x$ and b be equal to $3x$."

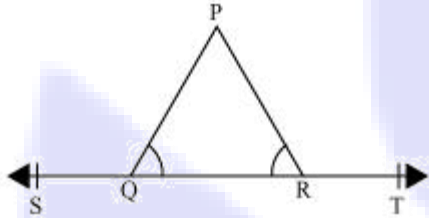
$$a + b = 90 \Rightarrow 2x + 3x = 90^\circ \Rightarrow 5x = 90^\circ \Rightarrow x = 18$$

$$\text{Therefore } b = 3 \times 18^\circ = 54^\circ$$

$$\text{Now } b + c = 180^\circ \text{ [Linear pair]}$$

$$54^\circ + c = 180^\circ \Rightarrow c = 180^\circ - 54^\circ = 126^\circ$$

Q.3 In the given figure, $\angle PQR = \angle PRQ$ then prove that $\angle PQS = \angle PRT$



Ans. We need to prove that $\angle PQS = \angle PRT$

We are given that $\angle PQR = \angle PRQ$

From the given figure, we can conclude that $\angle PQS$ and $\angle PRQ$, and $\angle PRS$ and $\angle PRT$ form a linear pair.

We know that sum of the angles of a linear pair is 180°

$$\therefore \angle PQS + \angle PQR = 180^\circ \text{ and (i)}$$

$$\angle PRQ + \angle PRT = 180^\circ \text{ (ii) } \angle PRQ + \angle PRT = 180^\circ \text{ (ii)}$$

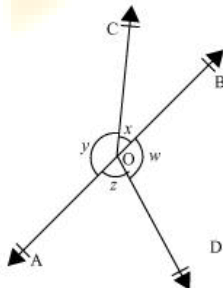
From equations (i) and (ii), we can conclude that

$$\angle PQS + \angle PQR = \angle PRQ + \angle PRT$$

$$\text{But, } \angle PQR = \angle PRQ (\because \angle PQS = \angle PRT)$$

Therefore, the desired result is proved.

Q.4 In Fig. 6.16, if $x + y = w + z$, then prove that AOB is a line.



Ans. We need to prove that AOB is a line.

We are given that $x + y = w + z$

We know that the sum of all the angles around a fixed point is 360° ,

Thus, we can conclude that $\angle AOC + \angle BOC + \angle AOD + \angle BOD = 360^\circ$ or

$$Y + x + z + w = 360^\circ$$

But, $x + y = w + z$ (Given)

$$2(y + x) = 360^\circ$$

$$Y + x = 180^\circ$$

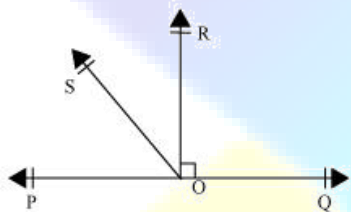
From the given figure, we can conclude that y and x form a linear pair.

We know that if a ray stands on a straight line, then the sum of the angles of linear pair formed by the ray with respect to the line is 180°

$$Y + x = 180^\circ$$

Therefore, we can conclude that AOB is a line.

- Q.5** In the given figure, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that $\angle ROS = \frac{1}{2} (\angle QOS - \angle POS)$



Ans- It is given that $OR \perp PQ$

$$\therefore \angle POR = 90^\circ$$

$$\Rightarrow \angle POS + \angle SOR = 90^\circ$$

$$\angle ROS = 90^\circ - \angle POS \dots (1)$$

$$\angle QOR = 90^\circ \text{ (As } OR \perp PQ)$$

$$\angle QOS - \angle ROS = 90^\circ$$

$$\angle ROS = \angle QOS - 90^\circ \dots (2)$$

On adding equations (1) and (2), we obtain

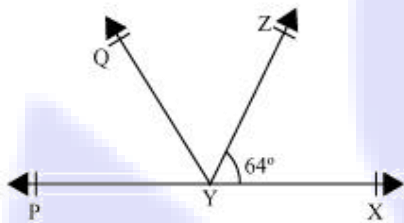
$$2 \angle ROS = \angle QOS - \angle POS$$

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

Q.6 It is given that $\angle XYZ = 64^\circ$ and XY is produced to point P. Draw a figure from the given information.

If ray YQ bisects $\angle ZYP$, find $\angle XYQ$ and reflex $\angle QYP$.

Ans-



It is given that line YQ bisects $\angle PYZ$.

Hence, $\angle QYP = \angle ZYQ$

It can be observed that PX is a line. Rays YQ and YZ stand on it.

$$\therefore \angle XYZ + \angle ZYQ + \angle QYP = 180^\circ$$

$$\Rightarrow 64^\circ + 2\angle QYP = 180^\circ$$

$$\Rightarrow 2\angle QYP = 180^\circ - 64^\circ = 116^\circ$$

$$\Rightarrow \angle QYP = 58^\circ$$

Also, $\angle ZYQ = \angle QYP = 58^\circ$

$$\text{Reflex } \angle QYP = 360^\circ - 58^\circ = 302^\circ$$

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

$$= 64^\circ + 58^\circ = 122^\circ$$