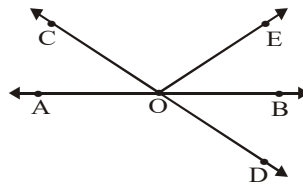CLASS IX: MATHS
Chapter 6: Lines And Angles


Questions and Solutions | Exercise 6.1 - NCERT Books

Q1. In figure, lines AB and CD intersect at O. If $\angle AOC + \angle BOE = 70°$ and $\angle BOD = 40°$, find $\angle BOE$ and reflex $\angle COE$.

Sol. $\angle AOC = \angle BOD$ [Vertically opposite angles]

$\Rightarrow \angle AOC = 40°$ [$\because \angle BOD = 40°$ is given]

Now, $\angle AOC + \angle BOE = 70°$ [Given]

$\Rightarrow 40° + \angle BOE = 70°$

$\Rightarrow \angle BOE = 30°$

$\angle AOE + \angle BOE = 180°$ [Linear pair of angles]

$\Rightarrow \angle AOE + 30° = 180°$

$\Rightarrow \angle AOE = 150°$

$\Rightarrow \angle AOC + \angle COE = 150°$

$\Rightarrow 40° + \angle COE = 150°$

$\Rightarrow \angle COE = 110°$

Reflex $\angle COE = 360° - 110° = 250°$

Q2. In figure, lines XY and MN intersect at O. If $\angle POY = 90°$ and $a : b = 2 : 3$, find c.
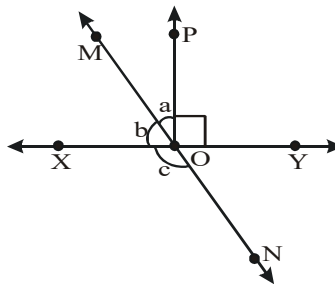
Sol. Ray OP stands on line XY

$\angle$POX + $\angle$ POY = 180°

$\angle$POX + 90° = 180°

$\angle$POX = 90°

$\angle$POM + $\angle$XOM = 90°

a + b = 90° .... (1)

a : b = 2 : 3

$\dfrac{a}{2} = \dfrac{b}{3} = k$ (let)

a = 2k, b = 3k

3k + 2k = 90° from (1)

k = 18°

$\Rightarrow$ a = 36° , b = 54°

$\therefore$ Ray OX stands on line MN

$\angle$ XOM + $\angle$ XON = 180°

b + c = 180°

54° + c = 180° $\Rightarrow$ c = 126°

Q3. In figure, $\angle$PQR = $\angle$PRQ, then prove that $\angle$PQS = $\angle$PRT.
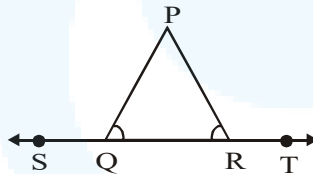
Sol. $\angle$PQR = $\angle$PRQ = x (say) ...(1)

Now, $\angle$PQS + $\angle$PQR = 180° [Linear pair of angles]

and $\angle$PRT + $\angle$PRQ = 180° [Linear pair of angles]

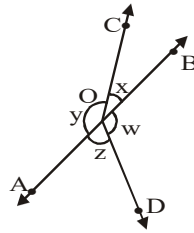$\Rightarrow \angle$PQS + $\angle$PQR = $\angle$PRT + $\angle$PRQ [$\because$ each = 180°]

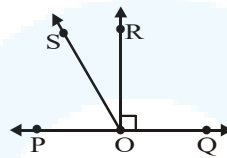$\Rightarrow \angle$PQS + x = $\angle$PRT + x [By (1)]

$\Rightarrow \angle$PQS = $\angle$PRT

Q4. In figure, if x + y = w + z, then prove that AOB is a line.

Sol. $x + y = w + z$ ...(1)

$x + y + w + z = 360°$ [Complete angle]

$\Rightarrow 2(x + y) = 360°, \ x + y = 180°$ [From (1)]

$\Rightarrow$ AOB is a line.

Q5. 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 $\angle ROS = \dfrac{1}{2}(\angle QOS - \angle POS)$.

Sol. $\angle POR = \angle QOR = 90°$ ...(1)

$[\because \ OR \perp PQ \ \text{at} \ O]$

Now, $\angle QOS = \angle QOR + \angle ROS$

$\Rightarrow \angle QOS = 90° + \angle ROS$ ...(2)   {by (1)}

$\angle POS + \angle ROS = \angle POR$

$\Rightarrow \angle POS = \angle POR - \angle ROS$

$\Rightarrow \angle POS = 90° - \angle ROS$ ...(3)   {by (1)}

Subtracting (3) from (2),

$\angle QOS - \angle POS = \{90° + \angle ROS\} - \{90° - \angle ROS\}$

$= 2 \times \angle ROS$

$\Rightarrow 2 \times \angle ROS = \{\angle QOS - \angle POS\}$

i.e., $\angle ROS = \dfrac{1}{2}\{\angle QOS - \angle POS\}$

Q6. It is given that $\angle XYZ = 64°$ 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 $\angle QYP$.
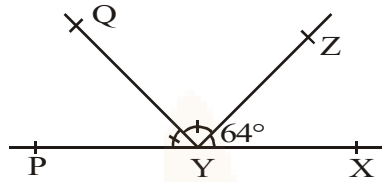
Sol. $\angle XYZ + \angle ZYP = 180°$ [Linear pair]

$\Rightarrow 64 + \angle ZYP = 180°$

$\Rightarrow \angle ZYP = 116°$

Ray YQ bisects angle $\angle ZYP$

$\Rightarrow \angle PYQ = \angle ZYP = \dfrac{116}{2} = 58°$

Reflex $\angle QYP = 360° - 58° = 302°$

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

$= 64° + 58° = 122°$