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HW
24/06/2021 Chapter - 6

Lines and Angles

Exercise 6.1

1) In Fig 6.13, lines AB and CD intersects at O. If AOC + BOE = 70° and BOD = 40°, find BOE and reflex COE.

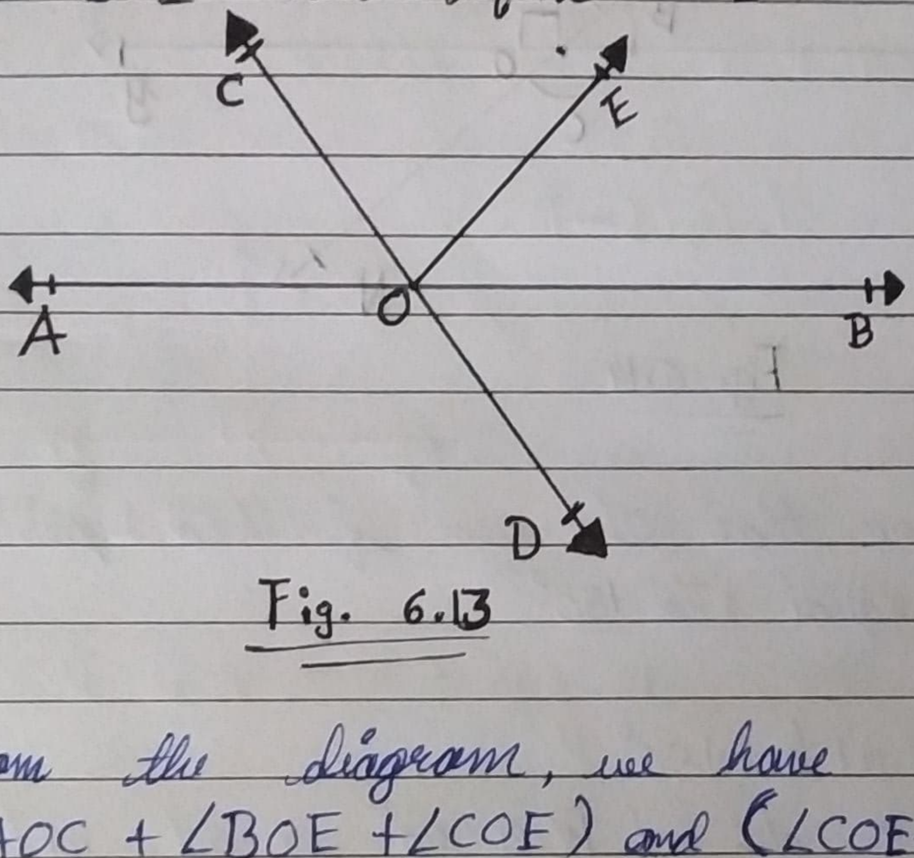


Fig. 6.13

ans) From the diagram, we have
($\angle AOC + \angle BOE + \angle COE$) and ($\angle COE + \angle BOD + \angle BOE$)
forms a straight line.
So, $\angle AOC + \angle BOE + \angle COE = \angle COE + \angle BOD + \angle BOE = 180°$
Now, by putting the values of $\angle AOC + \angle BOE = 70°$
and $\angle BOD = 40°$ we get,
$\angle COE = 110°$ and $\angle BOE = 30°$
So, reflex $\angle COE = 360° - 110°$
$= 250°$

2) In Fig. 6.14, lines XY and MN intersects at O. If POY = 90° and a : b = 2 : 3, find c.

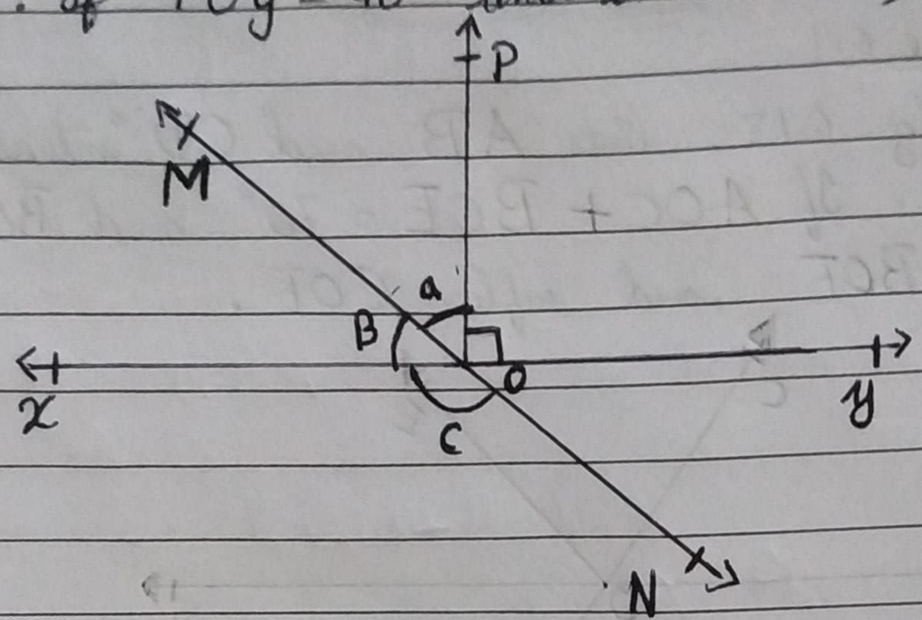


Fig. 6.14

ans) We know that the sum of linear pair are always equal to 180°

So,

POY + a + b = 180°

Putting the value of POY = 90°, we get, a + b = 90°

Now, it is given that a : b = 2 : 3 so, let a be 2x and b be 3x

∴ $2x + 3x = 90°$

Solving this we get

$5x = 90° = \frac{90}{5} = 18°$

∴ $a = 2 \times 18 = 36°$

$b = 3 \times 18 = 54°$

~~Similarly, he can be calculated~~ From the above,

b + c also forms a straight angle so,

$c + 54° = 180°$ ∴ $c = 126°$

3) In Fig. 6.15, PQR = PRQ, then prove that PQS = PRT.

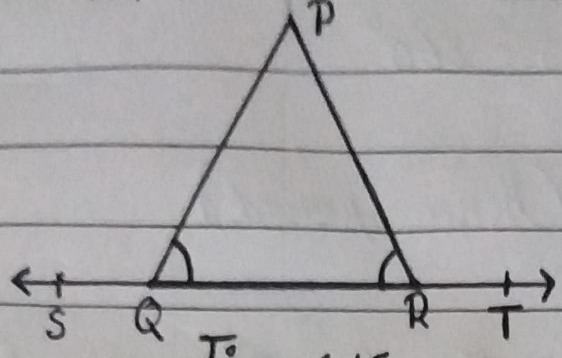


Fig. 6.15

ans) Since ST is a straight line so,
$\angle PQS + \angle PQR = 180°$ (linear pair) and
$\angle PRT + \cancel{\angle PQR}\ \angle PRQ = 180°$ (linear pair)
Now $\angle PQS + \angle PQR = \angle PRT + \angle PRQ = 180°$
Since $\angle PQR = \angle PRQ$ (as given in the question)
$\angle PQS = \angle PRT$ (Hence proved).

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

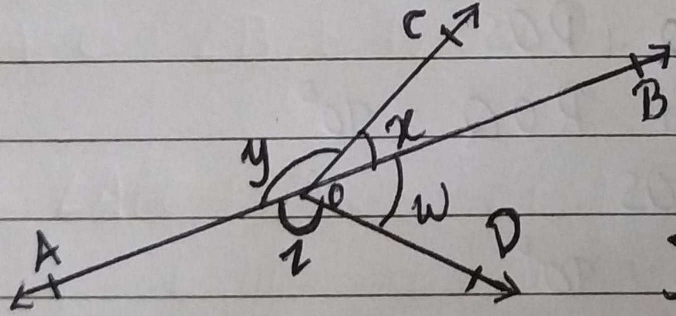


Fig. 6.16

ans) For proving AOB is a straight line, we will have to prove $x + y$ is a linear pair.
i.e. $x + y = 180°$
We know that the angles around a point are 360° so,
$x + y + w + z = 360°$

In the question, it is given ~~that~~ that,

$x + y = w + z$

So, $(x+y) + (x+y) = 360^\circ$

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

$\therefore (x+y) = 180^\circ$ (Hence proved)

5) In Fig. 6.17, POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that ROS = ½ (QOS − POS).

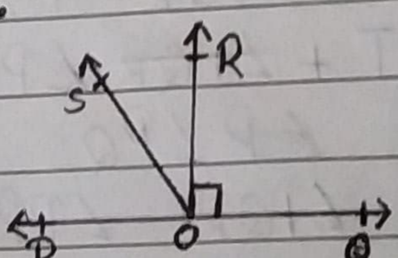


Fig. 6.17

ans) In the question, it is given that $(OR \perp PQ)$ and $POQ = 180^\circ$

So, $POS + ROS + ROQ = 180^\circ$

Now, $POS + ROS = 180^\circ - 90^\circ$ (since $POR = ROQ = 90^\circ$)

~~Now, QOS~~ $\therefore POS + ROS = 90^\circ$

Now, $QOS = ROQ + ROS$

It is given that $ROQ = 90^\circ$

$\therefore QOS = 90^\circ + ROS$

Or, $QOS - ROS = 90^\circ$

As $POS + ROS = 90^\circ$ & $QOS - ROS = 90^\circ$, we get

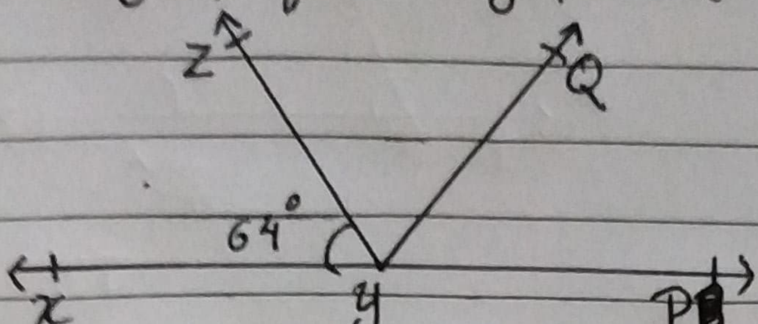
$POS + ROS = QOS - ROS$

$2\,ROS + \cancel{ROS}\ POS = QOS$

Or, $ROS = \left(\frac{1}{2}\right)(QOS + POS)$ (Hence proved)

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

ans)



Here, XP is a straight line

So, $XYZ + ZYP = 180°$

Putting the value of $XYZ = 64°$, we get,

$64° + ZYP = 180°$

$\therefore ZYP = 180° - \cancel{116}° \; 64° = 116°$

From the diagram, we know that ~~zyp=zyq+~~

$ZYP = ZYQ + QYP$

Now, as YQ bisects ZYP,

$ZYQ = QYP$ or, $ZYP = QYP = 58°$

Again, $XYQ = XYZ + ZYQ$

By putting the value of $XYZ = 64°$ and $ZYQ = 58°$ we get

$XYQ = 64° + 58° = 122°$

Now, reflex $QYP = 180° + XYQ$

We computed ~~tat~~ that the value of $XYQ = 122°$

So,

$QYP = 180° + 122°$

$\therefore QYP = 302°$