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

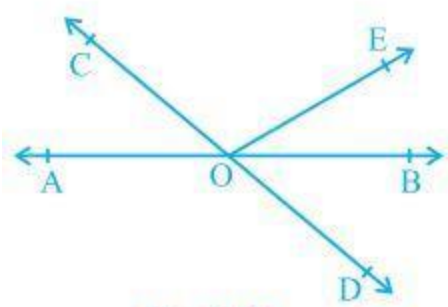

Fig. 6.13

Solution:

From the diagram, we have

(∠AOC +∠BOE +∠COE) and (∠COE +∠BOD +∠BOE) forms a straight line.

So, ∠AOC+∠BOE +∠COE = ∠COE +∠BOD+∠BOE = 180°

Now, by putting the values of ∠AOC + ∠BOE = 70° and ∠BOD = 40° we get

∠COE = 110° and ∠BOE = 30°

So, reflex ∠COE = $360^{\circ} - 110^{\circ} = 250^{\circ}$

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

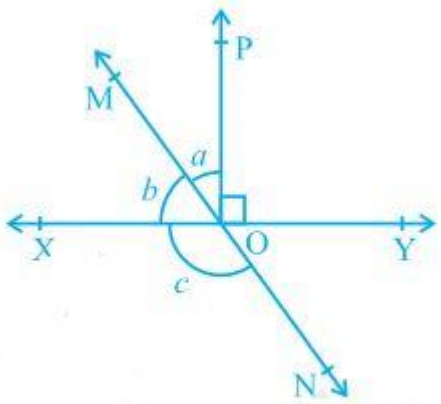

Fig. 6.14

Solution:

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

So,

POY +a +b = 180°

Putting the value of POY = 90° (as given in the question) 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°

So, x = 18°

∴ a = 2×18° = 36°

Similarly, b can be calculated and the value will be

b = 3×18° = 54°

From the diagram, b+c also forms a straight angle so,

b+c = 180°

c+54° = 180°

∴ c = 126°

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

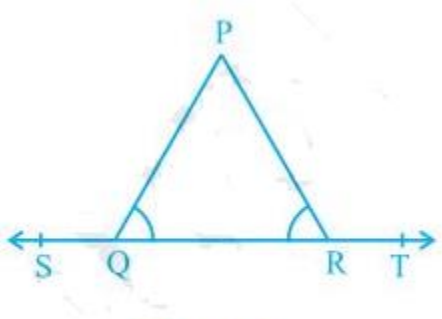

Fig. 6.15

Solution:

Since ST is a straight line so,

∠PQS+∠PQR = 180° (linear pair) and

∠PRT+∠PRQ = 180° (linear pair)

Now, ∠PQS + ∠PQR = ∠PRT+∠PRQ = 180°

Since ∠PQR =∠PRQ (as given in the question)

∠PQS = ∠PRT. (Hence proved).

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

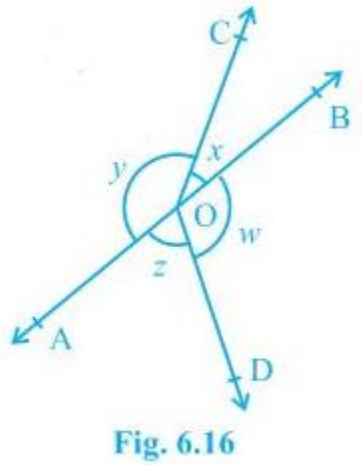

Fig. 6.16

Solution:

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,

$x+y = w+z$

So, $(x+y)+(x+y) = 360°$

$2(x+y) = 360°$

$\therefore (x+y) = 180°$ (Hence proved).