Question:1
Find the complement of each of the following angles:

i 35°
ii 47°
iii 60°
iv 73°
Solution:
i The given angle measures 35°.
Let the measure of its complement be x.

$x + 35° = 90°$
or $x = 90 - 35° = 55°$
Hence, the complement of the given angle will be 55°.

ii The given angle measures 47°.
Let the measure of its complement be x.

$x + 47° = 90°$
or $x = 90 - 47° = 43°$
Hence, the complement of the given angle will be 43°.

iii The given angle measures 60°.
Let the measure of its complement be x°.

$x + 60° = 90°$
or $x = 90 - 60° = 30°$
Hence, the complement of the given angle will be 30°.

iv The given angle measures 73°.
Let the measure of its complement be x.

$x + 73^o = 90°$
or $x = 90 - 73° = 17°$
Hence, the complement of the given angle will be 17°.

Question:2
Find the supplement of each of the following angles:

i 80°
ii 54°
iii 105°
iv 123°
Solution:
i The given angle measures 80°.
Let the measure of its supplement be x.

$x + 80° = 180°$
or $x = 180 - 80° = 100°$
Hence, the complement of the given angle will be 100°.

ii The given angle measures 54°.
Let the measure of its supplement be x.

$x + 54° = 180°$
or $x = 180 - 54° = 126°$
Hence, the complement of the given angle will be 126°.

iii The given angle measures 105°.
Let the measure of its supplement be x.

$x + 105° = 180°$
or, $x = 180 - 105° = 75°$

Hence, the complement of the given angle will be 75°.

iv
The given angle measures 123°.
Let the measure of its supplement be x.

x + 123° = 180°
or x = $180 - 123°$ = 57°
Hence, the complement of the given angle will be 57°.

Question:3
Among two supplementary angles, the measure of the larger angle is 36° more than the measure of the smaller. Find their measures.
Solution:
Let the two supplementary angles be x° and $180 - x°$.
Since it is given that the measure of the larger angle is 36° more than the smaller angle, let the larger angle be x°.
$\therefore 180 - x°$ + 36° = x°
or 216 = 2x
or 108 = x
Larger angle = 108°
Smaller angle = $108 - 36°$
= 72°

Question:4
Find the angle which is equal to its supplement.
Solution:
Let the measure of the required angle be x.

Since it is its own supplement:
$\mathrm{x} + \mathrm{x} = 180^{\circ} or\ 2x = 180^{\circ} or\ x = 90^{\circ}$
Therefore, the required angle is 90°.

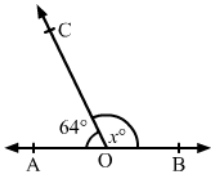
Question:5
Can two angles be supplementary if both of them are:

i acute?
ii obtuse?
iii right?
Solution:
i No. If both the angles are acute, i.e. less than 90°, they cannot be supplementary as their sum will always be less than 180°.

ii No. If both the angles are obtuse, i.e. more than 90°, they cannot be supplementary as their sum will always be more than 180°.

iii Yes. If both the angles are right, i.e. they both measure 90°, then they form a supplementary pair.
90° + 90° = 180°

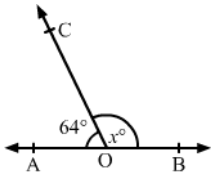
Question:6
In the given figure, *AOB* is a straight line and the ray *OC* stands on it.
If ∠*AOC* = 64° and ∠*BOC* = *x*°, find the value of *x*.



Solution:
By linear pair property:

$\angle \mathrm{AOC} + \angle \mathrm{COB} = 180^{\circ} 64^{\circ} + \angle \mathrm{COB} = 180^{\circ} \angle \mathrm{COB} = x^{\circ} = 180^{\circ} - 64^{\circ} = 116^{\circ}$

$\therefore$ x = 116

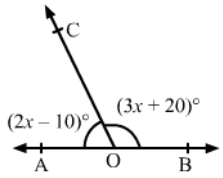


Question:7

In the given figure, *AOB* is a straight line and the ray *OC* stands on it.

If ∠*AOC* = (2*x* – 10)° and ∠*BOC* = (3*x* + 20)°, find the value of *x*.

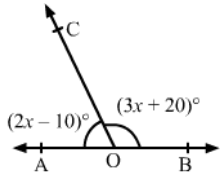
Also, find ∠*AOC* and ∠*BOC*



Solution:

By linear pair property:

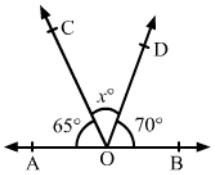
$\angle AOC + \angle BOC = 180^\circ or\ (2x-10)^\circ + (3x+20)^\circ = 180^\circ \quad (given) or\ 5x + 10 = 180 or\ 5x = 170 or\ x = 34 \therefore \angle AOC = (2x-10)^\circ = (2 \times 34 -$



Question:8

In the given figure, *AOB* is a straight line and the rays *OC* and *OD* stands on it.

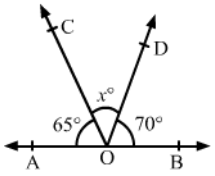
If ∠*AOC* = 65°, ∠*BOD* = 70° and ∠*COD* = *x*° find the value of *x*.



Solution:

Since AOB is a straight line, we have:

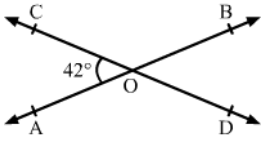
$\angle AOC + \angle BOD + \angle COD = 180^\circ \text{ or } 65^\circ + 70^\circ + x^\circ = 180^\circ \quad (\text{given}) \text{ or } 135^\circ + x^\circ = 180^\circ \text{ or } x^\circ = 45^\circ \text{ Thus, the value of } x \text{ is } 45$



Question:9

In the given figure, two straight line *AB* and *CD* intersect at a point *O*.

If ∠*AOC* = 42°, find the measure of each of the angles:

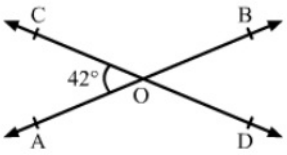


i ∠*AOD*

ii ∠*BOD*

iii ∠*COB*

Solution:



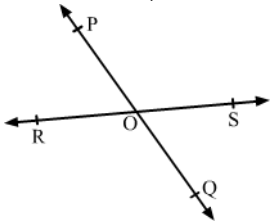
AB and CD intersect at O and CD is a straight line.

(i) $\angle \mathrm{COA} + \angle \mathrm{AOD} = 180^{\circ}$ (linear pair) $42^{\circ} + \angle \mathrm{AOD} = 180^{\circ} \angle \mathrm{AOD} = 138^{\circ}$ (ii) $\angle \mathrm{COA}$ and $\angle \mathrm{BOD}$ are vertically opposite angles. $\therefore \angle \mathrm{COA}$

Question:10

In the given figure, two straight line *PQ* and *RS* intersect at a *O*.

If $\angle POS = 114°$, find the measure of each of the angles:



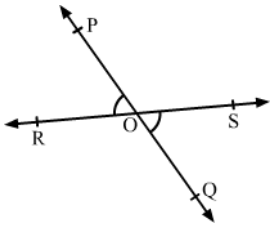
i $\angle POR$

ii $\angle ROQ$

iii $\angle QOS$

Solution:

(i) $\angle \mathrm{POS} + \angle \mathrm{POR} = 180^{\circ}$ (linear pair) or $114^{\circ} + \angle \mathrm{POR} = 180^{\circ}$ or $\angle \mathrm{POR} = 180^{\circ} - 114^{\circ} = 66^{\circ}$ (ii) Since $\angle \mathrm{POS}$ and $\angle \mathrm{QOR}$ are vertically

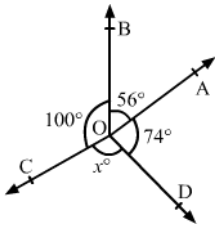


Question:11

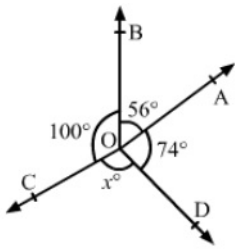
In the given figure, rays *OA*, *OB*, *OC* and *OD* are such that

$\angle AOB = 56°$, $\angle BOC = 100°$, $\angle COD = x°$ and $\angle DOA = 74°$.

Find the value of *x*.



Solution:



Sum of all the angles around a point is 360°.

$\therefore \angle AOB + \angle BOC + \angle COD + \angle DOA = 360^{\circ}$ or $56^{\circ} + 100^{\circ} + x^{\circ} + 74^{\circ} = 360^{\circ}$ (given) or $230^{\circ} + x^{\circ} = 360^{\circ}$ or $x^{\circ} = 130^{\circ}$ or $x = 130$