

Lines and Angles

Q1

Answer :

(i) The given angle measures 35° .
Let the measure of its complement be x .

$$\begin{aligned}x + 35^\circ &= 90^\circ \\ \text{or } x &= (90 - 35)^\circ = 55^\circ \\ \text{Hence, the complement of the given angle will be } 55^\circ.\end{aligned}$$

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

$$\begin{aligned}x + 47^\circ &= 90^\circ \\ \text{or } x &= (90 - 47)^\circ = 43^\circ \\ \text{Hence, the complement of the given angle will be } 43^\circ.\end{aligned}$$

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

$$\begin{aligned}x + 60^\circ &= 90^\circ \\ \text{or } x &= (90 - 60)^\circ = 30^\circ \\ \text{Hence, the complement of the given angle will be } 30^\circ.\end{aligned}$$

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

$$\begin{aligned}x + 73^\circ &= 90^\circ \\ \text{or } x &= (90 - 73)^\circ = 17^\circ \\ \text{Hence, the complement of the given angle will be } 17^\circ.\end{aligned}$$

Q2

Answer :

(i) The given angle measures 80° .

Let the measure of its supplement be x .

$$x + 80^\circ = 180^\circ$$

$$\text{or } x = (180 - 80)^\circ = 100^\circ$$

Hence, the complement of the given angle will be 100° .

(ii) The given angle measures 54° .

Let the measure of its supplement be x .

$$x + 54^\circ = 180^\circ$$

$$\text{or } x = (180 - 54)^\circ = 126^\circ$$

Hence, the complement of the given angle will be 126° .

(iii) The given angle measures 105° .

Let the measure of its supplement be x .

$$x + 105^\circ = 180^\circ$$

$$\text{or, } x = (180 - 105)^\circ = 75^\circ$$

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

(iv)

The given angle measures 123° .

Let the measure of its supplement be x .

$$x + 123^\circ = 180^\circ$$

Q3

Answer :

Let the two supplementary angles be x° and $(180 - x)^\circ$.

Since it is given that the measure of the larger angle is 36° more than the smaller angle, let the larger angle be x° .

$$\therefore (180 - x)^\circ + 36^\circ = x^\circ$$

$$\text{or } 216 = 2x$$

$$\text{or } 108 = x$$

$$\text{Larger angle} = 108^\circ$$

$$\begin{aligned}\text{Smaller angle} &= (108 - 36)^\circ \\ &= 72^\circ\end{aligned}$$

Q4

Answer :

Let the measure of the required angle be x .

Since it is its own supplement:

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

$$\text{or } 2x = 180^\circ$$

$$\text{or } x = 90^\circ$$

Therefore, the required angle is 90° .

Q5

Answer :

(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.

$$90^\circ + 90^\circ = 180^\circ$$

Q6

Answer :

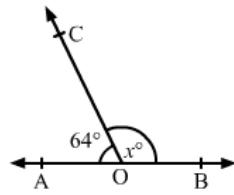
By linear pair property:

$$\angle AOC + \angle COB = 180^\circ$$

$$64^\circ + \angle COB = 180^\circ$$

$$\angle COB = x^\circ = 180^\circ - 64^\circ = 116^\circ$$

$$\therefore x = 116$$



Q7

Answer :

By linear pair property:

$$\angle AOC + \angle BOC = 180^\circ$$

$$\text{or } (2x - 10)^\circ + (3x + 20)^\circ = 180^\circ \quad (\text{given})$$

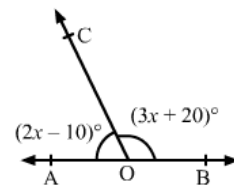
$$\text{or } 5x + 10 = 180$$

$$\text{or } 5x = 170$$

$$\text{or } x = 34$$

$$\therefore \angle AOC = (2x - 10)^\circ = (2 \times 34 - 10)^\circ = 58^\circ$$

$$\angle BOC = (3x + 20)^\circ = (3 \times 34 + 20)^\circ = 122^\circ$$



Q8

Answer :

Since AOB is a straight line, we have:

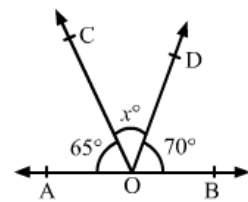
$$\angle AOC + \angle BOD + \angle COD = 180^\circ$$

$$\text{or } 65^\circ + 70^\circ + x^\circ = 180^\circ \quad (\text{given})$$

$$\text{or } 135^\circ + x^\circ = 180^\circ$$

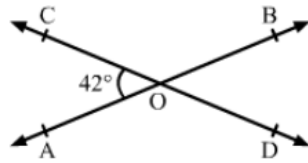
$$\text{or } x^\circ = 45^\circ$$

Thus, the value of x is 45



Q9

Answer :



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

(i) $\angle COA + \angle AOD = 180^\circ$ (linear pair)

$42^\circ + \angle AOD = 180^\circ$

$\angle AOD = 138^\circ$

(ii) $\angle COA$ and $\angle BOD$ are vertically opposite angles.

$\therefore \angle COA = \angle BOD = 42^\circ$ [from (i)]

(iii) $\angle COB$ and $\angle AOD$ are vertically opposite angles.

$\therefore \angle COB = \angle AOD = 138^\circ$ [from (i)]

Q10

Answer :

(i) $\angle POS + \angle POR = 180^\circ$ (linear pair)

or $114^\circ + \angle POR = 180^\circ$

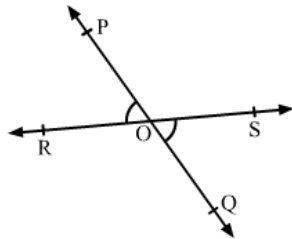
or $\angle POR = 180^\circ - 114^\circ = 66^\circ$

(ii) Since $\angle POS$ and $\angle QOR$ are vertically opposite angles, they are equal.

$\therefore \angle QOR = 114^\circ$

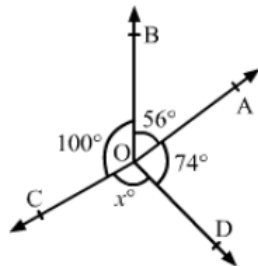
(iii) Since $\angle POR$ and $\angle QOS$ are vertically opposite angles, they are equal.

$\therefore \angle QOS = 66^\circ$



Q11

Answer :



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 $x = 130$