

Lines and Angles

Q1

Answer :

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

$$x + 35^\circ = 90^\circ$$
$$\text{or } x = (90 - 35)^\circ = 55^\circ$$

Hence, the complement of the given angle will be 55° .

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

$$x + 47^\circ = 90^\circ$$
$$\text{or } x = (90 - 47)^\circ = 43^\circ$$

Hence, the complement of the given angle will be 43° .

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

$$x + 60^\circ = 90^\circ$$
$$\text{or } x = (90 - 60)^\circ = 30^\circ$$

Hence, the complement of the given angle will be 30° .

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

$$x + 73^\circ = 90^\circ$$
$$\text{or } x = (90 - 73)^\circ = 17^\circ$$

Hence, the complement of the given angle will be 17° .

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° .
 $\therefore (180 - x)^\circ + 36^\circ = x^\circ$
or $216 = 2x$
or $108 = x$
Larger angle = 108°
Smaller angle = $(108 - 36)^\circ$
 $= 72^\circ$

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

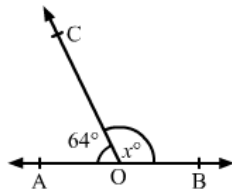
Q6

Answer :

By linear pair property:

$$\begin{aligned}\angle AOC + \angle COB &= 180^\circ \\ 64^\circ + \angle COB &= 180^\circ \\ \angle COB = x^\circ &= 180^\circ - 64^\circ = 116^\circ\end{aligned}$$

$$\therefore x = 116$$

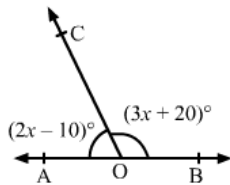


Q7

Answer :

By linear pair property:

$$\begin{aligned}\angle AOC + \angle BOC &= 180^\circ \\ \text{or } (2x - 10)^\circ + (3x + 20)^\circ &= 180^\circ \quad (\text{given}) \\ \text{or } 5x + 10 &= 180 \\ \text{or } 5x &= 170 \\ \text{or } x &= 34 \\ \therefore \angle AOC &= (2x - 10)^\circ = (2 \times 34 - 10)^\circ = 58^\circ \\ \angle BOC &= (3x + 20)^\circ = (3 \times 34 + 20)^\circ = 122^\circ\end{aligned}$$



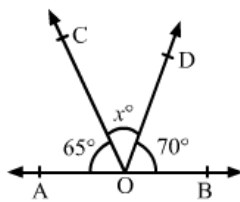
Q8

Answer :

Since AOB is a straight line, we have:

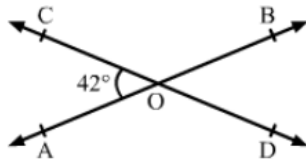
$$\begin{aligned}\angle AOC + \angle BOD + \angle COD &= 180^\circ \\ \text{or } 65^\circ + 70^\circ + x^\circ &= 180^\circ \quad (\text{given}) \\ \text{or } 135^\circ + x^\circ &= 180^\circ \\ \text{or } x^\circ &= 45^\circ\end{aligned}$$

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

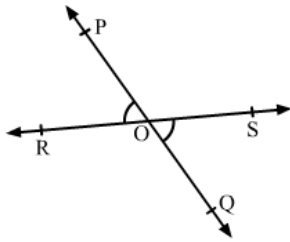
or $\angle POR = 180^\circ - 114^\circ = 66^\circ$

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

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

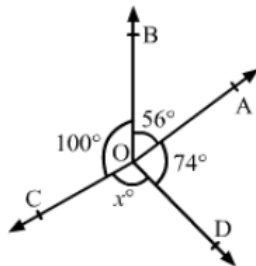
(iii) Since $\angle POR$ and $\angle QOS$ are vertically opposite angles, they are equal.

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



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 $x = 130$