

# Lines and Angles

Q1

**Answer :**

(i) The given angle measures  $35^\circ$ .  
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  $47^\circ$ .  
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  $60^\circ$ .  
Let the measure of its complement be  $x^\circ$ .

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

(iv) The given angle measures  $73^\circ$ .  
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  $80^\circ$ .

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  $100^\circ$ .

(ii) The given angle measures  $54^\circ$ .

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  $126^\circ$ .

(iii) The given angle measures  $105^\circ$ .

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  $75^\circ$ .

(iv)

The given angle measures  $123^\circ$ .

Let the measure of its supplement be  $x$ .

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

Q3

**Answer :**

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

Since it is given that the measure of the larger angle is  $36^\circ$  more than the smaller angle, let the larger angle be  $x^\circ$ .

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

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

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

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

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

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  $90^\circ$ .

Q5

**Answer :**

(i) No. If both the angles are acute, i.e. less than  $90^\circ$ , they cannot be supplementary as their sum will always be less than  $180^\circ$ .

(ii) No. If both the angles are obtuse, i.e. more than  $90^\circ$ , they cannot be supplementary as their sum will always be more than  $180^\circ$ .

(iii) Yes. If both the angles are right, i.e. they both measure  $90^\circ$ , then they form a supplementary pair.

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

Q6

**Answer :**

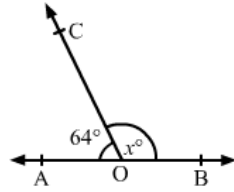
By linear pair property:

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

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

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

$$\therefore x = 116$$



Q7

**Answer :**

By linear pair property:

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

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

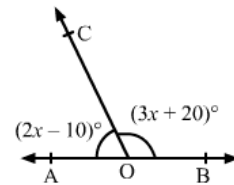
$$\text{or } 5x + 10 = 180$$

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

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

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

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



Q8

**Answer :**

Since AOB is a straight line, we have:

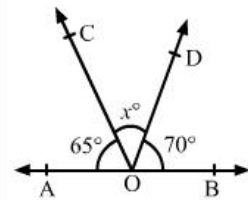
$$\angle AOC + \angle BOD + \angle COD = 180^\circ$$

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

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

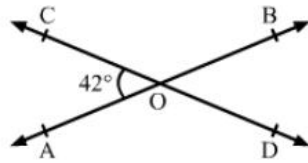
$$\text{or } x^\circ = 45^\circ$$

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

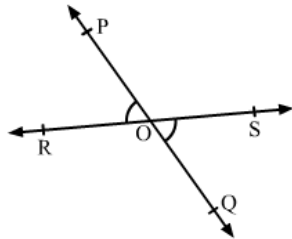
or  $\angle POR = 180^\circ - 114^\circ = 66^\circ$

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

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

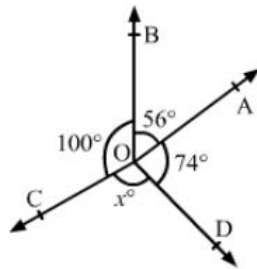
(iii) Since  $\angle POR$  and  $\angle QOS$  are vertically opposite angles, they are equal.

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



Q11

Answer :



Sum of all the angles around a point is  $360^\circ$ .

$\therefore \angle AOB + \angle BOC + \angle COD + \angle DOA = 360^\circ$

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  $x = 130$