Lines and Angles

Q1

Answer :

(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°.

Q2

Answer :

(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°

Q3

Answer :

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°.
∴ (180 − x)° + 36° = x°
or 216 = 2x
or 108 = x
Larger angle = 108°
Smaller angle = (108 − 36)°
= 72°

Q4

Answer :

Let the measure of the required angle be x.

Since it is its own supplement:
$\mathbf{x + x = 180^{\circ}}$
$\boldsymbol{or}\ 2x = 180^{\circ}$
$\boldsymbol{or}\ x = 90^{\circ}$
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° + 90° = 180°

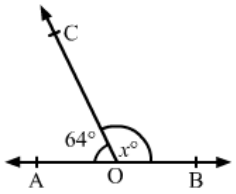
Q6

Answer :

By linear pair property:

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

∴ x = 116

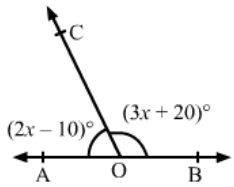


Q7

Answer :

By linear pair property:

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

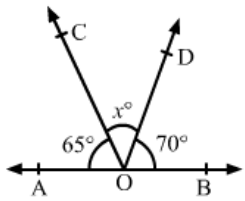


Q8

Answer :

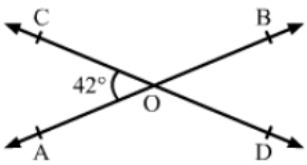
Since AOB is a straight line, we have:

$\angle AOC + \angle BOD + \angle COD = 180^\circ$
or $65^\circ + 70^\circ + x^\circ = 180^\circ \quad$ (given)
or $135^\circ + x^\circ = 180^\circ$
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.

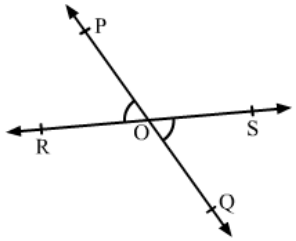
(i) $\angle COA + \angle AOD = 180^\circ$ (linear pair)
$42^\circ + \angle AOD = 180^\circ$
$\angle AOD = 138^\circ$
(ii) $\angle COA$ and $\angle BOD$ are vertically opposite angles.

$\therefore \angle COA = \angle BOD = 42^\circ$ [from (i)]
(iii) $\angle COB$ and $\angle AOD$ are vertically opposite angles.
$\therefore \angle COB = \angle AOD = 138^\circ$ [from (i)]

Q10

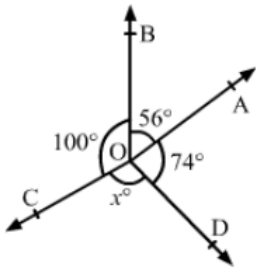
Answer :

(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 $x = 130$