

Q 1 : Write the complement of each of the following angles:

(i) 20° (ii) 35° (iii) 90° (iv) 77° (v) 30°

Ans : (i) given angle is 20

Since, the sum of an angle and its complement is 90

Hence, its complement will be ($90 - 20 = 70$)

(ii) Given angle is 35

Since, the sum of an angle and its complement is 90

Hence, its complement will be ($90 - 35 = 55$)

(iii) Given angle is 90

Since, the sum of an angle and its complement is 90

Hence, its complement will be ($90 - 90 = 0$)

(iv) Given angle is 77

Since, the sum of an angle and its complement is 90

Hence, its complement will be ($90 - 77 = 13$)

(v) Given angle is 30

Since, the sum of an angle and its complement is 90

Hence, its complement will be ($90 - 30 = 60$)

Q 2 : Write the supplement of each of the following angles:

(i) 54° (ii) 132° (iii) 138°

Ans : (i) The given angle is 54,

Since the sum of an angle and its supplement is 180,

Hence, Its supplement will be ($180 - 54 = 126$)

(ii) The given angle is 132,

Since the sum of an angle and its supplement is 180,

Hence, its supplement will be $180 - 132 = 48$

(iii) The given angle is 138,

Since the sum of an angle and its supplement is 180,

Hence, Its supplement will be $180 - 138 = 42$

Q 3 : If an angle is 28° less than its complement, find its measure?

Ans: Let the angle measured be ' x ' in degrees

Hence, Its complement will be $90 - x^\circ$

$$\text{Angle} = \text{Complement} - 28$$

$$x = (90 - x) - 28$$

$$2x = 62$$

$$x = 31$$

Therefore, angle measured is 31°

Q 4 : If an angle is 30° more than half of its complement, find the measure of the angle?

Ans : Let the measured angle be 'x'

Hence its complement will be $(90-x)$

It is given that,

$$\text{Angle} = 30 + \text{complement}/2$$

$$x = 30 + (90 - x) / 2$$

$$3 \frac{x}{2} = 30 + 45$$

$$3x = 150$$

$$x = 50$$

Therefore the angle is 50°

Q 5 : Two supplementary angles are in the ratio 4:5. Find the angles?

Ans : Supplementary angles are in the ratio 4:5

Let the angles be $4x$ and $5x$

It is given that they are supplementary angles

$$\text{Hence } 4x + 5x = 180$$

$$9x = 180$$

$$x = 20$$

$$\text{Hence, } 4x = 4(20) = 80$$

$$5(x) = 5(20) = 100$$

Hence, angles are 80 and 100

Q 6 : Two supplementary angles differ by 48° . Find the angles ?

Ans : Given that two supplementary angles differ by 48°

Let the angle measured be x°

Therefore, Its supplementary angle will be $(180 - x)^\circ$

It is given that :

$$(180 - x) - x = 48$$

$$(180 - 48) = 2x$$

$$2x = 132$$

$$x = 132/2$$

$$x = 66$$

$$\text{Hence, } 180 - x = 114^\circ$$

Therefore, the angles are 66 and 114.

Q 7 : An angle is equal to 8 times its complement. Determine its measure?

Ans : It is given that required angle = 8 times its complement

Let 'x' be the measured angle

angle = 8 times complement

$$\text{angle} = 8 (90 - x)$$

$$x = 8 (90 - x)$$

$$x = 720 - 8x$$

$$x + 8x = 720$$

$$9x = 720$$

$$x = 80$$

Therefore measured angle is 80.

Q 8 : If the angles $(2x - 10)^\circ$ and $(x - 5)^\circ$ are complementary, find x ?

Ans : Given that $(2x - 10)^\circ$ and $(x - 5)^\circ$ are complementary

Since angles are complementary, their sum will be 90

$$(2x - 10) + (x - 5) = 90$$

$$3x - 15 = 90$$

$$3x = 90 + 15$$

$$3x = 105$$

$$x = 105/3$$

$$x = 35$$

Hence, the value of $x = (35)^\circ$

Q 9 : If the complement of an angle is equal to the supplement of Thrice of itself, find the measure of the angle ?

Ans : Let the angle measured be 'x' say.

Its complementary angle is $(90 - x)$ and

Its supplementary angle is $(180 - 3x)$

Given that, Supplementary of 4 times the angle = $(180 - 3x)$

According to the given information;

$$(90 - x) = (180 - 3x)$$

$$3x - x = 180 - 90$$

$$2x = 90$$

$$x = 90/2$$

$$x = 45$$

Therefore, the measured angle $x = (45)^\circ$

Q 10 : If an angle differs from its complement by $(10)^\circ$, find the angle ?

Ans : Let the measured angle be 'x' say

Given that,

The angles measured will differ by $(20)^\circ$

$$x - (90 - x) = 10$$

$$x - 90 + x = 10$$

$$2x = 90 + 10$$

$$2x = 100$$

$$x = 100/2$$

$$x = 50$$

Therefore the measure of the angle is $(50)^\circ$

Q 11 : If the supplement of an angle is 3 times its complement, find its angle ?

Ans : Let the angle in case be ' x '

Given that,

Supplement of an angle = 3 times its complementary angle

Supplementary angle = $180 - x$

Complementary angle = $90 - x$

Applying given data,

$$180 - x = 3 (90 - x)$$

$$3x - x = 270 - 180$$

$$2x = 90$$

$$x = 90/2$$

$$x = 45$$

Therefore, the angle in case is 45°

Q 12 : If the supplement of an angle is two third of itself. Determine the angle and its supplement?

Ans: Supplementary of an angle = $\frac{2}{3}$ angle

Let the angle in case be ' x ',

Supplementary of angle x will be ($180 - x$)

It is given that

$$180 - x = \frac{2}{3}x$$

$$(180 - x) 3 = 2x$$

$$540 - 3x = 2x$$

$$5x = 540$$

$$x = 540/5$$

$$x = 108$$

Hence, supplementary angle = $180 - 108 = 72$

Therefore, angles in case are 108° and supplementary angle is 72°

Q 13 : An angle is 14° more than its complementary angle. What is its measure?

Ans: Let the angle in case be ' x ',

Complementary angle of ' x ' is ($90 - x$)

From given data,

$$x - (90 - x) = 14$$

$$x - 90 + x = 14$$

$$2x = 90 + 14$$

$$2x = 104$$

$$x = 104/2$$

$$x = 52$$

Hence the angle in case is found to be 52°

Q 14 : The measure of an angle is twice the measure of its supplementary angle. Find the measure of the angles?

Ans : Let the angle in case be ' x '

The supplementary of a angle x is $(180 - x)$

Applying given data:

$$x = 2 (180 - x)$$

$$x = 360 - 2x$$

$$3x = 360$$

$$x = 360/3$$

$$x = 120$$

Therefore the value of the angle in case is 120°