

**RD SHARMA**

**Solutions**

**Class 9 Maths**

**Chapter 8**

**Ex 8.1**

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

(i)  $20^\circ$  (ii)  $35^\circ$  (iii)  $90^\circ$  (iv)  $77^\circ$  (v)  $30^\circ$

**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)  $54^\circ$  (ii)  $132^\circ$  (iii)  $138^\circ$

**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  $28^\circ$  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  $31^\circ$

**Q 4 : If an angle is  $30^\circ$  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,

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

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

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

$$3x = 150$$

$$x = 50$$

Therefore the angle is  $50^\circ$

**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

Hence  $4x + 5x = 180$

$$9x = 180$$

$$x = 20$$

Hence,  $4x = 4(20) = 80$

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

Hence, angles are 80 and 100

**Q 6 : Two supplementary angles differ by  $48^\circ$ . Find the angles ?**

**Ans :** Given that two supplementary angles differ by  $48^\circ$

Let the angle measured be  $x^\circ$

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

It is given that :

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

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

$$2x = 132$$

$$x = 132/2$$

$$x = 66$$

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 compliment 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  $45^\circ$

**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  $108^\circ$  and supplementary angle is  $72^\circ$

**Q 13 : An angle is  $14^\circ$  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  $52^\circ$

**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  $120^\circ$