

Exercise 8.1

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**Question 1: Write the complement of each of the following angles:**(i)  $20^\circ$ (ii)  $35^\circ$ (iii)  $90^\circ$ (iv)  $77^\circ$ (v)  $30^\circ$ **Solution:**

(i) The sum of an angle and its complement =  $90^\circ$   
Therefore, the complement of  $20^\circ = 90^\circ - 20^\circ = 70^\circ$

(ii) The sum of an angle and its complement =  $90^\circ$   
Therefore, the complement of  $35^\circ = 90^\circ - 35^\circ = 55^\circ$

(iii) The sum of an angle and its complement =  $90^\circ$   
Therefore, the complement of  $90^\circ = 90^\circ - 90^\circ = 0^\circ$

(iv) The sum of an angle and its complement =  $90^\circ$   
Therefore, the complement of  $77^\circ = 90^\circ - 77^\circ = 13^\circ$

(v) The sum of an angle and its complement =  $90^\circ$   
Therefore, the complement of  $30^\circ = 90^\circ - 30^\circ = 60^\circ$

**Question 2 : Write the supplement of each of the following angles:**(i)  $54^\circ$ (ii)  $132^\circ$ (iii)  $138^\circ$ **Solution:**

(i) The sum of an angle and its supplement =  $180^\circ$ .  
Therefore supplement of angle  $54^\circ = 180^\circ - 54^\circ = 126^\circ$

(ii) The sum of an angle and its supplement =  $180^\circ$ .  
Therefore supplement of angle  $132^\circ = 180^\circ - 132^\circ = 48^\circ$

(iii) The sum of an angle and its supplement =  $180^\circ$ .  
Therefore supplement of angle  $138^\circ = 180^\circ - 138^\circ = 42^\circ$

**Question 3: If an angle is  $28^\circ$  less than its complement, find its measure?**

**Solution:**

Let the measure of any angle is 'a' degrees

Thus, its complement will be  $(90 - a)^\circ$

So, the required angle = Complement of a – 28

$$a = (90 - a) - 28$$

$$2a = 62$$

$$a = 31$$

Hence, the angle measured is  $31^\circ$ .

**Question 4 : If an angle is  $30^\circ$  more than one half of its complement, find the measure of the angle?**

**Solution:**

Let an angle measured by 'a' in degrees

Thus, its complement will be  $(90 - a)^\circ$

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

$$a = 30^\circ + (90 - a)^\circ / 2$$

$$a + a/2 = 30^\circ + 45^\circ$$

$$3a/2 = 75^\circ$$

$$a = 50^\circ$$

Therefore, the measure of required angle is  $50^\circ$ .

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

**Solution:**

Two supplementary angles are in the ratio 4:5.

Let us say, the angles are 4a and 5a (in degrees)

Since angle are supplementary angles;

Which implies,  $4a + 5a = 180^\circ$

$$9a = 180^\circ$$

$$a = 20^\circ$$

Therefore,  $4a = 4(20) = 80^\circ$  and

$$5(a) = 5(20) = 100^\circ$$

Hence, required angles are  $80^\circ$  and  $100^\circ$ .

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

**Solution:** Given: Two supplementary angles differ by  $48^\circ$ .

Consider  $a^\circ$  be one angle then its supplementary angle will be equal to  $(180 - a)^\circ$

According to the question;

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

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

$$132 = 2a$$

$$132/2 = a$$

$$\text{Or } a = 66^\circ$$

$$\text{Therefore, } 180 - a = 114^\circ$$

Hence, the two angles are  $66^\circ$  and  $114^\circ$ .

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

**Solution:** Given: Required angle = 8 times of its complement

Consider  $a^\circ$  be one angle then its complementary angle will be equal to  $(90 - a)^\circ$

According to the question;

$a = 8$  times of its complement

$$a = 8 ( 90 - a )$$

$$a = 720 - 8a$$

$$a + 8a = 720$$

$$9a = 720$$

$$a = 80$$

Therefore, the required angle is  $80^\circ$ .