EXERCISE 24 (B)

Question 1.

Write the complement angle of :

(i) 45°

(ii) x°

(iii) (x – 10)°

(iv) 20° + y°

Solution:

(i) Complement angle of 45°

= 90° – 45° = 45°

(ii) Complement angle of x°

= 90° – x° = (90 – x)°

(iii) Complement angle of (x - 10)° = 90° (x - 10°)

= 90°-x + 10° = 100°-x

(iv) Complement angle of 20° + y°

= 90°-(20°+y°)

= 90° - 20° -y° = 70° -y°

Question 2.

Write the supplement angle of :

(i) 49°

(ii) 111°

(iii) (x – 30)°

(iv) 20° + y°

Solution:

(i) Supplement angle of 49°

= 180°-49° = 131°

(ii) Supplement angle of 111°

= 180°- 1110 = 69°

(iii) Supplment of (x – 30)° = 180° – (x° – 30°)

= 180o – x° + 30° – 210° – x°

(iv) Supplement of ∠20° + y° = 180° - (20° +y°)

= 180° -20°-y°

= 160° -y°

Question 3.

Write the complement angle of :

(i) $\frac{1}{2}$ of 60° (ii) 1/5 of 160°

(*iii*) $\frac{2}{5}$ of 70° (*iv*) 1/6 of 90°

Solution:

(*i*) Complement angle of $\left(\frac{1}{2}\text{ of } 60°\right)$

$= 90° - \left(\frac{1}{2} \text{ of } 60°\right)$

$= 90° - 30° = \mathbf{60°}$

(*ii*) Complement angle of $\frac{1}{5}$ of 160°

$= 90° - \left(\frac{1}{5} \times 160°\right)$

$= 90° - 32° = 58°$

(*iii*) Complement angle of $\left(\frac{2}{5} \text{ of } 70°\right)$

$= 90° - \left(\frac{2}{5} \text{ of } 70°\right)$

$= 90° - 28° = \mathbf{62°}$

(*iv*) Complement angle of $\frac{1}{6}$ of 90°

$= 90° - \left(\frac{1}{6} \text{ of } 90°\right)$

$= 90° - 15° = 75°$

Question 4.

(*i*) 50% of 120° (*ii*) $\frac{1}{3}$ of 150°

(*iii*) 60% of 100° (*iv*) $\frac{3}{4}$ of 160°

Solution:

(*i*) Supplement angle of 50% of 120° = 180° – (50% of 120°)

$= 180^\circ - \left(\frac{120^\circ \times 50}{100}\right)$

$= 180^\circ - 60^\circ = 120^\circ$

(*ii*) Supplement angle of $\left(\frac{1}{3} \text{ of } 150^\circ\right)$

$= 180^\circ - \left(\frac{1}{3} \text{ of } 150^\circ\right)$

$= 180^\circ - 50^\circ = \mathbf{130^\circ}$

(*iii*) Supplement angle of 60% of 100° = 180° – (60% of 100°)

$= 180^\circ - \left(\frac{60}{100} \times 100\right)$

$= 180^\circ - 60^\circ = 120^\circ$

(*iv*) Supplement of $\frac{3}{4}$ of 160

$= 180^\circ - \left(\frac{3}{4} \text{ of } 160^\circ\right)$

$= 180^\circ - 120^\circ$

$= \mathbf{60^\circ}$

Question 5.

Find the angle :

(i) that is equal to its complement ?

(ii) that is equal to its supplement ?

Solution:

(i) 45° is equal to its complement.

(ii) 90° is equal to its supplement.

Question 6.

Two complementary angles are in the ratio 7 : 8. Find the angles.

Solution:

Let two complementary angles are lx and 8x

∴ 7x + 8x = 90°

⇒ 15x = 90°

⇒ x = $\frac{90}{15}$°

⇒ x = 6°
∴Two complementary angles are
7x = 7 x 6° = 42°
8x = 8 x 6° = 48°

Question 7.
Two supplementary angles are in the ratio 7 : 11. Find the angles.
Solution:
Let two supplementary angles are 7x and 11x
∴ 7x+ 11x= 180°
⇒ 18x = 180°
⇒ x = $\frac{180}{18}$
⇒ x = 10°
Two supplementary angles are
7x = 7 x 10° = 70°
11x= 11 x 10°= 110°

Question 8.
The measures of two complementary angles are (2x – 7)° and (x + 4)°. Find x.
Solution:
We know that, sum of two complementary angles = 90°
∴(2x – 7) + (x + 4) = 90°
2x-7 + x + 4 = 90°
⇒ 2x + x – 7 + 4 = 90°
⇒ 3x – 3 = 90°
⇒ 3x = 90 + 3
⇒ 3x = 93
⇒ x = $\frac{93}{3}$
x = 31

Question 9.
The measures of two supplementary angles are (3x + 15)° and (2x + 5)°. Find x.
Solution:
We know that, sum of two supplementary angles = 180°
∴ (3x + 15)° + (2x + 5)° = 180° ‘
3x + 15 + 2x + 5 = 180°
⇒ 3x + 2x+15 + 5 = 180°
⇒ 5x°+ 20° = 180°
⇒ 5x = 180° – 20°
⇒ 5x= 160°
⇒ x = $\frac{160}{5}$
⇒ x = 32°

Question 10.

For an angle x°, find :

(i) the complementary angle

(ii) the supplementary angle

(iii) the value of x° if its supplementary angle is three times its complementary angle.

Solution:

For an angle x,

(i) Complementary angle of x° = (90° - x)

(ii) Supplementary angle of x° = (180° - x)

(iii) ∵'Supplementary angle = 3 (complementary anlge)

180°- x = 3 (90°-x)

⇒ 180°-x = 270°- 3x

⇒-x + 3x = 270°-180°

⇒ 2x = 90°

⇒x= $\frac{90}{2}$ = 45°

∴ x = 45°