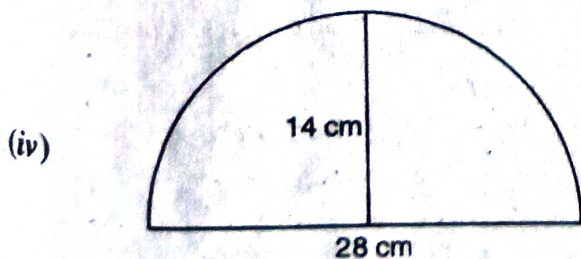## TEXT BOOK EXERCISE 9.1

Q. 1. Find the perimeter and area of the following figures :

(i)

(ii)

(iii)

(iv)

(v)
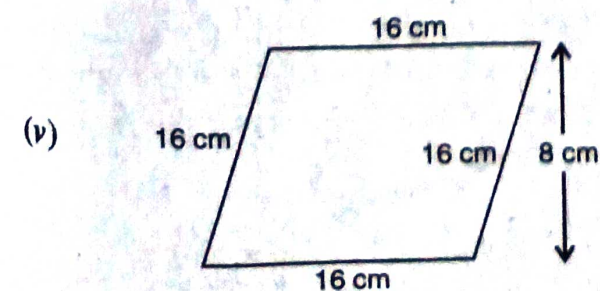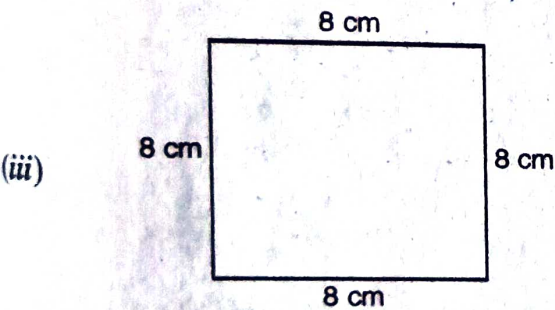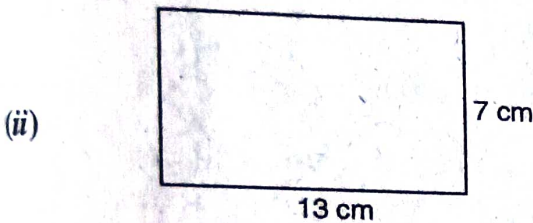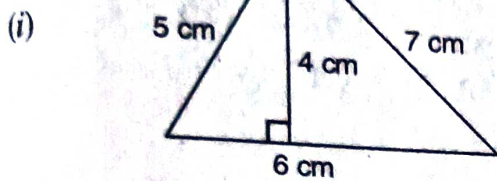
Solution. (*i*) Perimeter of triangle
$$= 5 \text{ cm} + 6 \text{ cm} + 7 \text{ cm}$$
$$= 18 \text{ cm Ans.}$$

Area of triangle $= \dfrac{1}{2} \times$ base $\times$ height

$$= \left(\dfrac{1}{2} \times 6 \times 4\right) \text{cm}^2$$

$$= 12 \text{ cm}^2 \text{ Ans.}$$

(*ii*) Length of rectangle = 13 cm
Breadth of rectangle = 7 cm
Perimeter of rectangle = 2 (length + breadth)
$$= 2 (13 \text{ cm} + 7 \text{ cm})$$
$$= 2 (20 \text{ cm}) = 40 \text{ cm Ans.}$$
Area of rectangle = length × breadth
$$= (13 \times 7) \text{ cm}^2 = 91 \text{ cm}^2$$
Ans.

(*iii*) Side of square = 8 cm
∴ Perimeter of square = 4 × side
$$= 4 \times 8 \text{ cm} = 32 \text{ cm Ans.}$$
Area of square $= (\text{side})^2 = (8 \text{ cm})^2$
$$= 64 \text{ cm}^2 \text{ Ans.}$$

(*iv*) Diameter of the semicircle = 28 cm

Radius of the semicircle $(r) = \dfrac{28}{2}$ cm
$$= 14 \text{ cm}$$

So, perimeter (circumference) of the semicircle
$$= \pi r + 2r$$

$$= \left(\dfrac{22}{7} \times 14 + 2 \times 14\right) \text{cm}$$

$$= (44 + 28) \text{ cm} = 72 \text{ cm}$$
Ans.

Area of the semicircle $= \dfrac{1}{2} \pi r^2$

$$= \frac{1}{2} \times \frac{22}{7} \times 14 \times 14 \text{ cm}^2$$

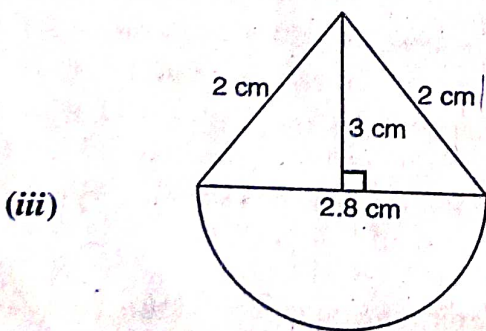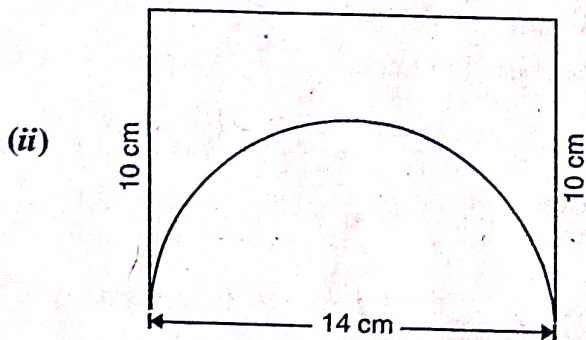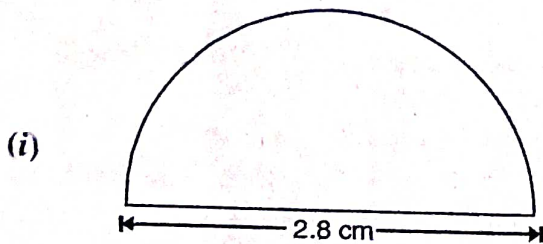$$= 308 \text{ cm}^2 \text{ Ans.}$$

(v) Perimeter of the figure

$$= 16 \text{ cm} + 16 \text{ cm} + 16 \text{ cm}$$
$$+ 16 \text{ cm} = 64 \text{ cm Ans.}$$

Area of the figure = 16×8 cm² = 128 cm²

Ans.

Q. 2. Find the area and perimeter of the following figures :

(i)

|← 2.8 cm →|

(ii)

10 cm   10 cm

|← 14 cm →|

(iii)

2 cm   2 cm
    3 cm
    2.8 cm

Solution. (i) Diameter of semicircle = 2.8 cm

Radius (r) of the semicircle (r) = $\frac{2.8}{2}$ cm

$$= 1.4 \text{ cm}$$

∴ Area of semicircle = $\frac{1}{2}\pi r^2$

$$= \frac{1}{2} \times \frac{22}{7} \times 1.4 \times 1.4 \text{ cm}^2$$

$$= \frac{1}{2} \times \frac{22}{7} \times \frac{14}{10} \times \frac{14}{40} \text{ cm}^2$$

$$= \frac{308}{10} \text{ cm}^2 = 30.8 \text{ cm}^2 \text{ Ans.}$$

Perimeter of semicircle = $\pi r + 2r$

$$= \left[\frac{22}{7} \times 1.4 + 2 \times 1.4 \right] \text{cm}$$

$$= \left[\frac{22}{7} \times 1.4 + 2.8 \right] \text{cm}$$

$$= (4.4 + 2.8) \text{ cm}$$
$$= 7.2 \text{ cm Ans.}$$

(ii) Diameter of semicircle = 14 cm

Radius (r) of the circle = $\frac{14}{2}$ cm = 7 cm

Length (l) of the figure = 14 cm
Breadth (b) of the figure = 10 cm
Area of figure = Area of rectangle − Area of semicircle

$$= (l \times b) - \frac{1}{2}\pi r^2$$

$$= \left[(14 \times 10) - \frac{1}{2} \times \frac{22}{7} \times 7 \times 7 \right] \text{cm}^2$$

$$= (140 - 77) \text{ cm}^2 = 63 \text{ cm}^2 \text{ Ans.}$$

Perimeter of the figure
= Arc of the circle + 10 cm +
14 cm + 10 cm

$$= \pi r + 34 \text{ cm} = \left(\frac{22}{7} \times 7 + 34 \right) \text{ cm}$$

$$= (22 + 34) \text{ cm}$$
$$= 56 \text{ cm Ans.}$$

(iii) Diameter of the semicircle = 2.8 cm
Radius (r) of the semicircle = 1.4 cm
Area of the figure = Area of the semicircle + Area of triangle

$$= \pi r + \frac{1}{2} \text{ base} \times \text{height}$$

$$= \left(\frac{22}{7} \times 1.4 + \frac{1}{2} \times 2.8 \times 3\right) \text{cm}^2$$

$$= (4.4 + 4.2) = 8.6 \text{ cm}^2 \text{ Ans.}$$

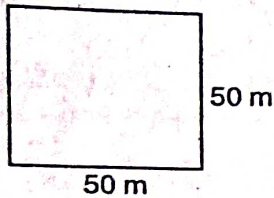Perimeter of the figure = Arc of the circle + perimeter of triangle

$$= \pi r + 2.8 \text{ cm} + 2 \text{ cm} + 2 \text{ cm}$$
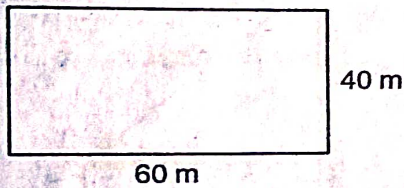
$$= \left(\frac{22}{7} \times 1.4 + 6.8\right) \text{cm}$$

$$= (4.4 + 6.8) \text{ cm} = 11.2 \text{ cm Ans}$$

Q. 3. A square and a rectangular field with measurements (as shown in given figures) have the same perimeter. Which field has larger area and how much ?

(i)

50 m

50 m

(ii)

40 m

60 m

Solution. (i) Side of square = 50 m

$$\text{Area of square} = (\text{side})^2$$
$$= (50 \text{ m})^2$$
$$= 2500 \text{ m}^2$$

(ii) Length (*l*) of rectangle = 60 m

Breadth (*b*) of rectangle = 40 m

$$\text{Area of rectangle} = l \times b$$
$$= 60 \text{ m} \times 40 \text{ m}$$
$$= 2400 \text{ m}^2$$

Square has larger area than rectangle by (2500 - 2400) m² *i.e.* 100 m² Ans.

Q. 4. A park is of length 30 m and breadth 20 m. There is a path of one metre running inside along the perimeter of the park [fig. 9.7 (Textbook)] The path has to be cemented. If 1 bag of cement is required to cement 4m² area. How many bags of cement are required to construct the path ?

1 m

20 m 1 m

1 m

1 m

30 m
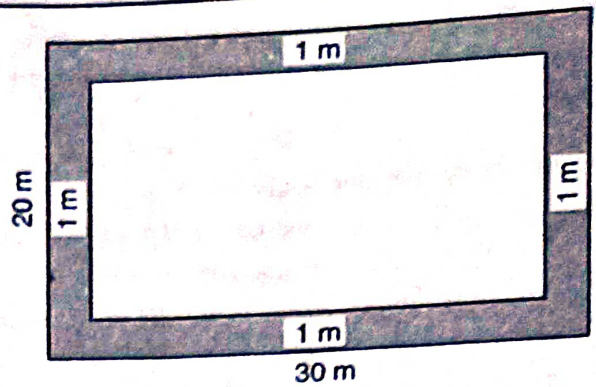
Solution. Length (*l*) of the park = 30 m

Breadth (*b*) of the park = 20 m

$$\text{Area of the park} = l \times b = 30 \text{ m} \times 20 \text{ m}$$
$$= 600 \text{ m}^2$$

Width of the park = 1 m

Length of the park inside the path
$$= 30 \text{ m} - 2\text{m} = 28 \text{ m}$$

Breadth of park inside the path
$$= 20 \text{ m} - 2\text{m} = 18 \text{ m}$$

Area of the park inside the path
$$= 28 \text{ m} \times 18 \text{ m}$$
$$= 504 \text{ m}^2$$

$$\text{Area of the path} = 600 \text{ m}^2 - 504 \text{ m}^2$$
$$= 96 \text{ m}^2$$

Bags of cement required to construct 4 m² path
= 1

Bags of cement required to construct 96 m²
$$\text{path} = \frac{96 \text{ m}^2}{4 \text{ m}^2} = 24 \text{ Ans.}$$

Q. 5. Mr. Sandeep has a square plot as shown in figure 9.8 (Textbook) and he wants to construct a house in the middle of plot. A garden is developed around the house. Find the total cost of developing a garden around the house at the rate of ₹ 60 per m².

25 m 15 m House

20 m

25 m
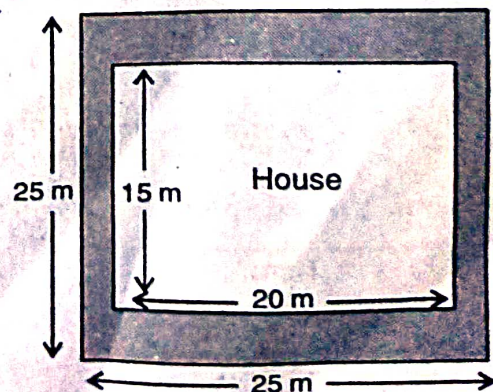
Solution. Side of the square plot = 25 m

$$\text{Area of the square plot} = (\text{side})^2$$
$$= 25 \text{ m}^2$$
$$= 625 \text{ m}^2$$

Length (l) of the house = 20 m

Breadth (b) of the house = 15 m

$$\text{Area of the house} = l \times b$$
$$= 20 \text{ m} \times 15 \text{ m}$$
$$= 300 \text{ m}^2$$

Area of the garden
$$= \text{Area of the plot} - \text{Area of the house}$$
$$= 625 \text{ m}^2 - 300 \text{ m}^2$$
$$= 325 \text{ m}^2$$

Cost of 1 m^2 = ₹ 60

Cost of 325 m^2 = ₹ 60 × 325
$$= ₹ 19500 \textbf{ Ans.}$$