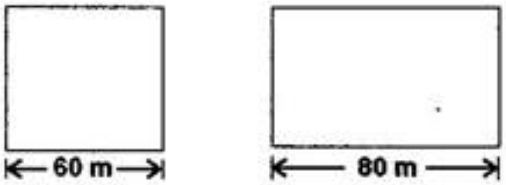
NCERT solutions for class 8 maths chapter 11 mensuration

Q1. A square and a rectangular field with measurements as given in the figure have the same perimeter.

Which field has a larger area?



(a) (b)

Ans. Given: The side of a square = 60 m

And the length of rectangular field = 80 m

According to question,

Perimeter of rectangular field

= Perimeter of square field

$\Rightarrow 2(l+b) = 4 \times \text{side}$

$\Rightarrow 2(80+b) = 4 \times 60$

$\Rightarrow 160 + 2b = 240$

$\Rightarrow 2b = 240 - 160$

$\Rightarrow 2b = 80$

$\Rightarrow b = 40$ m

Now Area of Square field

$= (\text{Side})^2$

$= (60)^2 = 3600$ m^2

And Area of Rectangular field

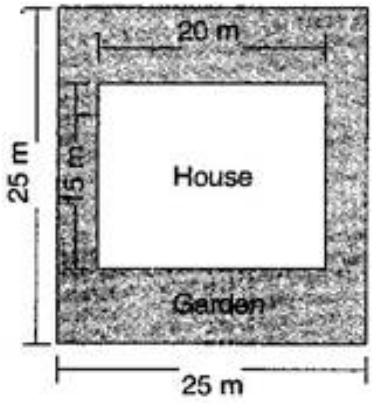
$= \text{length} \times \text{breadth} = 80 \times 40$

$= 3200$ m^2

Hence, area of square field is larger.

Q2. Mrs. Kaushik has a square plot with the measurement as shown in the figure. She wants to construct a house in the middle of the plot. A garden is developed around the house. Find the total cost of developing a garden around the house at the rate of ` 55

per m^2.

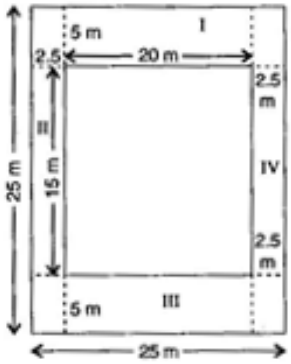


Ans. Side of a square plot = 25 m

$\therefore$ Area of square plot = $(\text{Side})^2$

$= (25)^2 = 625\ m^2$

Length of the house = 20 m and



Breadth of the house = 15 m

$\therefore$ Area of the house = length $\times$ breadth

$= 20 \times 15 = 300\ m^2$

Area of garden = Area of square plot

– Area of house

$= 625 - 300 = 325\ m^2$

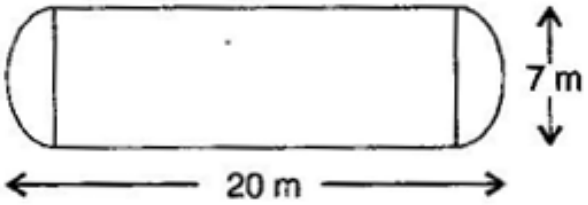
$\because$ Cost of developing the garden per sq. m = ` 55

$\therefore$ Cost of developing the garden 325 sq. m = ` 55 $\times$ 325

= ` 17,875

Hence total cost of developing a garden around is ` 17,875.

Q3. The shape of a garden is rectangular in the middle and semi-circular at the ends as shown in the diagram. Find the area and the perimeter of this garden [Length of rectangle is 20 – (3.5 + 3.5 meters]



Ans. Given: Total length = 20 m

Diameter of semi circle = 7 m

$\therefore$ Radius of semi circle = $\frac{7}{2}$ = 3.5 m

Length of rectangular field

$= 20 - (3.5 + 3.5) = 20 - 7 = 13$ m

Breadth of the rectangular field = 7 m

$\therefore$ Area of rectangular field = $l \times b$

$= 13 \times 7 = 91\ m^2$

Area of two semi circles = $2 \times \frac{1}{2} \pi r^2$

$= 2 \times \frac{1}{2} \times \frac{22}{7} \times 3.5 \times 3.5 = 38.5\ m^2$

Area of garden = 91 + 38.5 = 129.5 m^2

Now Perimeter of two semi circles =

$2 \times \pi r = 2 \times \frac{22}{7} \times 3.5 = 22\ m$

And Perimeter of garden

= 22 + 13 + 13

= 48 m

Q4. A flooring tile has the shape of a parallelogram whose base is 24 cm and the corresponding height is 10 cm. How many such tiles are required to cover a floor of area 1080 m^2 ? [If required you can split the tiles in whatever way you want to fill up the corners]

Ans. Given: Base of flooring tile = 24 cm

= 0.24 m

Corresponding height of a flooring tile

= 10 cm = 0.10 m

Now Area of flooring tile

= Base $\times$ Altitude

= 0.24 $\times$ 0.10

$= 0.024\ m^2$

$\therefore$ Number of tiles required to cover the floor

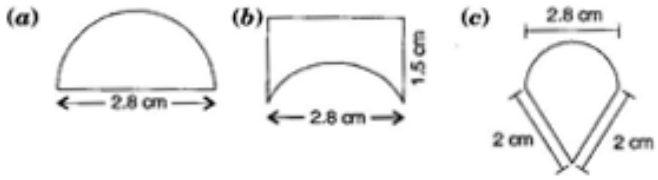
$$= \frac{\text{Area of floor}}{\text{Area of one tile}}$$

$$= \frac{1080}{0.024}$$

= 45000 tiles

Hence 45000 tiles are required to cover the floor.

Q5. An ant is moving around a few food pieces of different shapes scattered on the floor. For which food-piece would the ant have to take a longer round? Remember, circumference of a circle can be obtained by using the expression $c = 2\pi r$, where r is the radius of the circle.

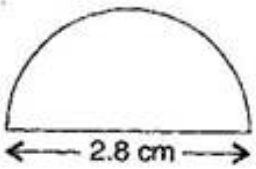


Ans. (a) Radius $= \frac{\text{Diameter}}{2} = \frac{2.8}{2}$

= 1.4 cm

Circumference of semi circle = πr

$= \frac{22}{7} \times 1.4 = 4.4$ cm

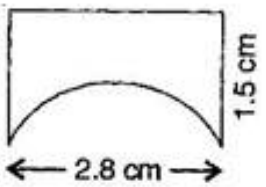


Total distance covered by the ant

= Circumference of semi circle + Diameter

= 4.4 + 2.8 = 7.2 cm

(b) Diameter of semi circle = 2.8 cm



$$\therefore \text{Radius} = \frac{\text{Diameter}}{2} = \frac{2.8}{2} = 1.4$$ cm

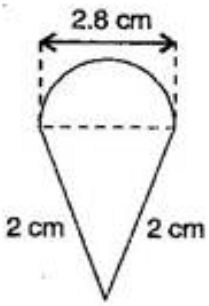
Circumference of semi circle = πr

$$= \frac{22}{7} \times 1.4 = 4.4 \text{ cm}$$

Total distance covered by the ant

= 1.5 + 2.8 + 1.5 + 4.4 = 10.2 cm

(c) Diameter of semi circle = 2.8 cm



$$\therefore \text{Radius} = \frac{\text{Diameter}}{2} = \frac{2.8}{2}$$

= 1.4 cm

Circumference of semi circle = πr

$$= \frac{22}{7} \times 1.4 = 4.4 \text{ cm}$$

Total distance covered by the ant

= 2 + 2 + 4.4 = 8.4 cm

Hence for figure (b) food piece, the ant would take a longer round.

********** END **********