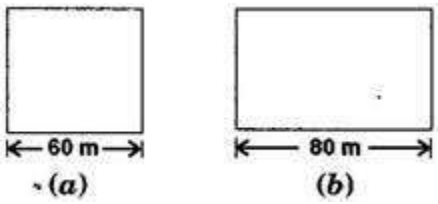
Exercise 11.1 Page No: 171

1. **A square and a rectangular field with measurements as given in the figure have the same perimeter. Which field has a larger area?**



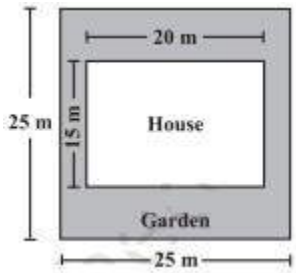
Solution:
Side of a square = 60 m (Given)
And the length of rectangular field, l = 80 m (Given)
According to question,
Perimeter of rectangular field = Perimeter of square field
2(l+b) = 4×Side (using formulas)

2(80+b) = 4×60
160+2b = 240
b = 40
Breadth of the rectangle is 40 m.

Now, Area of Square field
= $(side)^2$
= $(60)^2$ = 3600 m^2
And Area of Rectangular field
= length×breadth = 80×40
= 3200 m^2

Hence, area of square field is larger.

2. 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 Rs. 55 per m^2.



Solution:

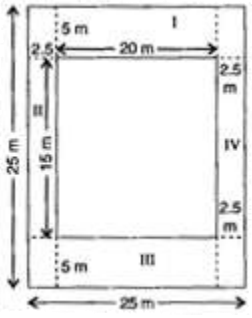
Side of a square plot = 25 m

Formula: Area of square plot = square of a side = $(\text{side})^2$

$= (25)^2 = 625$

Therefore the area of a square plot is 625 m^2

Length of the house = 20 m and



Breadth of the house = 15 m

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

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

Area of garden = Area of square plot – Area of house

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

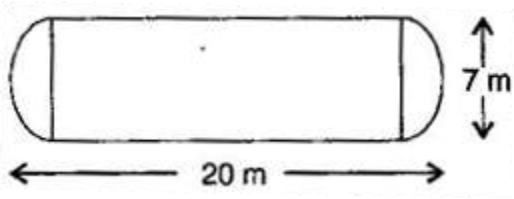
$\because$ Cost of developing the garden per sq. m is Rs. 55

∴ Cost of developing the garden 325 sq. m = Rs. 55×325

= Rs. 17,875

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

3. 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]



Solution::

Given: Total length = 20 m

Diameter of semi circle = 7 m

∴ Radius of semi circle = 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

∴ Area of rectangular field = l×b

= 13×7= 91m^2

Area of two semi circles = $2\times(1/2)\times\pi\times r^2$

$= 2\times(1/2)\times22/7\times3.5\times3.5$
$= 38.5\ m^2$

Area of garden = $91+38.5 = 129.5\ m^2$
Now Perimeter of two semi circles = $2\pi r = 2\times(22/7)\times3.5 = 22$ m

And Perimeter of garden = 22+13+13

= 48 m. Answer

4. 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]

Solution:

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×Altitude

$= 0.24\times0.10$

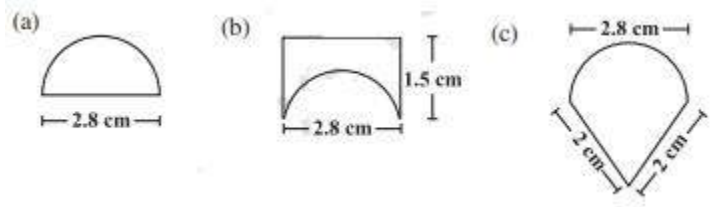
$= 0.024$
Area of flooring tile is $0.024m^2$

$\therefore$ Number of tiles required to cover the floor= Area of floor/Area of one tile = $1080/0.024$

= 45000 tiles

Hence 45000 tiles are required to cover the floor.

5. 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.



Solution:

(a) Radius = Diameter/2 = 2.8/2 cm = 1.4 cm

Circumference of semi-circle = πr

$= (22/7)\times 1.4 = 4.4$

Circumference of semi-circle is 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
Radius = Diameter/2 = 2.8/2 = 1.4 cm

Circumference of semi-circle = πr

$= (22/7)\times 1.4 = 4.4$ 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
Radius = Diameter/2 = 2.8/2

= 1.4 cm

Circumference of semi-circle = πr

$= (22/7)\times 1.4$

= 4.4 cm

Total distance covered by the ant = 2+2+4.4 = 8.4 cm

After analyzing results of three figures, we concluded that for figure (b) food piece, the ant would take a longer round.