

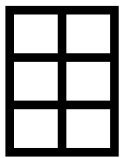
Chapter 6: Mensuration

NCERT Exemplar · Class 6 · Maths

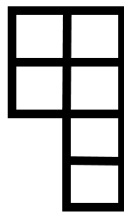
Exercise

Question 1

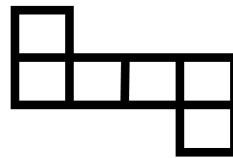
The following figures are formed by joining six-unit squares. Which figure has the smallest perimeter in Fig. 6.4



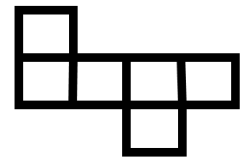
(i)



(ii)



(iii)



(iv)

Fig. 6.4

(A) (ii)

(B) (iii)

(C) (iv)

(D) (i)

Solution

Ans: Correct option - D

Perimeter = sum of all sides

For the option (i) = 10 Units:

For the option (ii) = 12 Units

For the option (iii) = 14 Units

For the option (vi) = 14 Units

So, figure (i) has the smallest perimeter.

Question 2

A square-shaped park ABCD of side 100m has two equal rectangular flower beds each of size 10m × 5m. Fig.6.5 Length of the boundary of the remaining park is

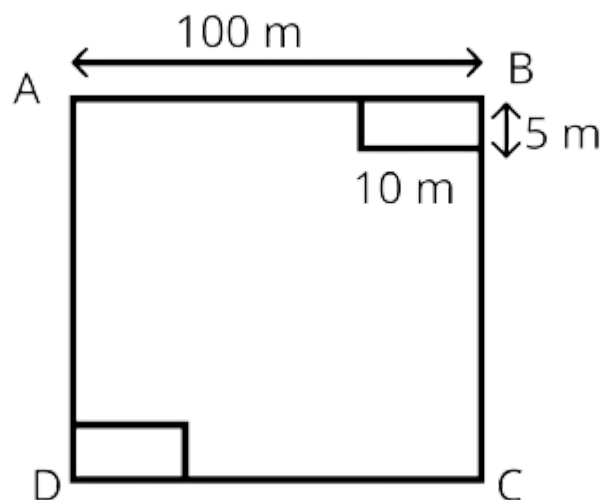


Fig. 6.5

(A) 360m

(B) 400m

(C) 340m

(D) 460m

Solution

Ans: Correct option - B

Given ,length =10m

Breadth = 5 m

Than remaining park's length=90m

Breadth =95m

So, perimeter of remaining park = $90 + 5 + 10 + 95 + 90 + 5 + 10 + 95 = 400\text{m}$

Question 3

The side of a square is 10cm. How many times will the new perimeter become if the side of the square is doubled?

(A) 2 times

(B) 4 times

(C) 6 times

(D) 8 times

Solution

Ans: Correct option - A

Given,side of square = 10 cm

Than perimeter of square= $4 \times \text{Sides} = 4 \times 10\text{cm} = 40\text{cm}$

If the side of the square is doubled.

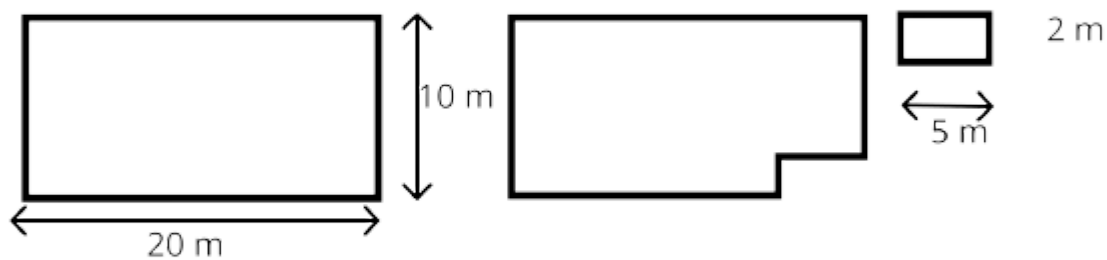
New side of square = $2 \times 10\text{cm} = 20\text{cm}$

Perimeter of new square = $4 \times \text{Sides} = 4 \times 20\text{cm} = 80\text{cm}$

So,the new perimeter has doubled from the old perimeter.

Question 4

The length and breadth of a rectangular sheet of paper are 20 cm and 10 cm, respectively. A rectangular piece is cut from the sheet as shown in Fig.6.6 . Which of the following statements is correct for the remaining sheet?

**Fig. 6.6**

- (A) Perimeter remains the same but area changes.
- (B) The area remains the same but the perimeter changes.
- (C) Both area and perimeter are changing.
- (D) Both area and perimeter remain the same.

Solution

Ans: Correct option - A

Perimeter remains the same as the given figure but the area changes after cutting the piece.

$$\text{Old perimeter} = 2(L + B) = 2(20 + 10) = 60m$$

$$\text{New perimeter} = 10 + 20 + 8 + 5 + 2 + 15 = 60m$$

$$\text{Old Area} = L \times B = 20 \times 10 = 200m^2$$

$$\text{New Area} = (20 \times 10) - (5 \times 2) = 190m^2$$

Question 5

Two regular Hexagons of perimeter 30cm each are joined as shown in Fig. 6.7. The perimeter of the new figure is

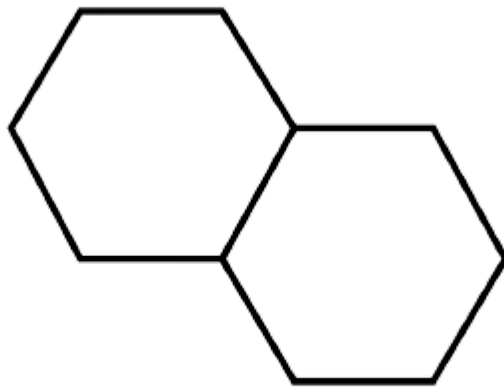


Fig. 6.7

(A) 65cm

(B) 60cm

(C) 55cm

(D) 50cm

Solution

Ans: Correct option - D

Given, Perimeter of hexagon = 30cm

Perimeter of hexagon = $6 \times \text{side}$

$$30 = 6 \times \text{side}$$

$$\frac{30}{6} = \text{sides}$$

5cm=side.

So,perimeter of given Figure= $10 \times \text{side}$

$$= 10 \times 5\text{cm} = 50\text{cm} \quad [\text{total number of sides of the new figure is } 10]$$

Question 6

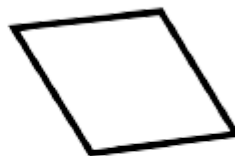
In Fig. 6.8 which of the following is a regular polygon? All have equal side except (i)



(i)



(ii)



(iii)



(iv)

6.8

(A) (i)

(B) (ii)

(C) (iii)

(D) (iv)

Solution

Ans: Correct option - B

Because for a regular polygon, all sides and angles must be equal. Only (ii) is satisfying this condition.

Question 7

Match the shapes (each side's measures 2cm) in column I with the corresponding perimeters in column II:

Column I	Column II
(A)	(i) 16 cm
(B)	
(C)	
(D)	
	(ii) 20 cm
	(iii) 24 cm
	(iv) 28 cm



Solution

Ans: Perimeter of Given figure = sum of all sides

Given ,each side= 2cm

(A) No. of sides=14

Perimeter = $14 \times$ length of sides

$$= 14 \times 2cm = 28cm$$

(B) No. of sides=8

Perimeter = $8 \times$ length of sides

$$= 8 \times 2cm = 16cm$$

(C) No. of sides=10

Perimeter = $10 \times$ length of side

$$= 10 \times 2cm = 20cm$$

(D) No. of sides=12

Perimeter= $12 \times$ length of sides

$$= 12 \times 2cm = 24cm$$

Column I	Column II
(A)	(iv) 28 cm

(B)	(i) 16 cm
(C)	(ii) 20 cm
(D)	(iii) 24 cm

Question 8

Match the following.

Shapes	Perimeter
(A)	(i) 10
(B)	(ii) 18
(C)	(iii) 20
(D)	(iv) 25

Solution

Ans: Perimeter of Given figure = sum of all sides

(A) We know it's a rectangle.

$$\begin{aligned}\text{Perimeter of rectangle} &= 2 \times (l + b) \\ &= 2 \times (6 + 4) = 2 \times 10 = 20\text{unit}\end{aligned}$$

(B) We know it's a square

$$\begin{aligned}\text{Perimeter of square} &= 4 \times \text{length of sides} \\ &= 4 \times 5\text{unit} = 20\text{ unit}\end{aligned}$$

(C) We know it's a equilateral triangle

$$\begin{aligned}\text{Perimeter of equilateral triangle} &= 3 \times \text{length of side} \\ &= 3 \times 6\text{unit} = 18\text{unit}\end{aligned}$$

(D) We know it's a Isosceles triangle

$$\begin{aligned}\text{Perimeter Isosceles triangle} &= \text{sum of all sides} \\ &= 4 + 4 + 2 = 10\text{ unit}\end{aligned}$$

Question 9

Perimeter of the shaded portion in Fig. 6.9 is

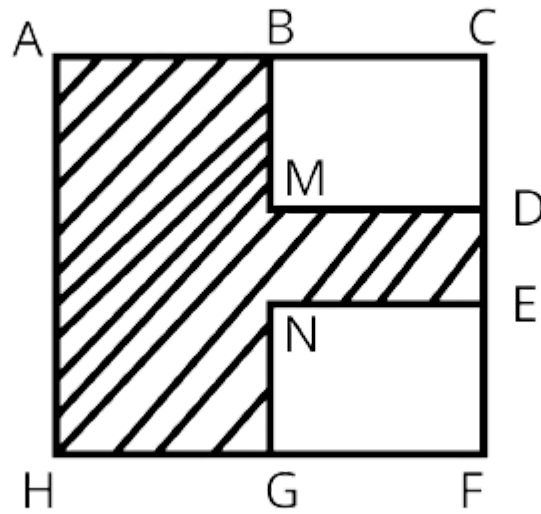


Fig. 6.9

$AB + BM + MD + DE + EN + NG + GH + HA$

Solution

Ans: We know Perimeter = sum of all sides

The sides of given figure AB, BM, MD, DE, EN, NG, GH and HA

So, the perimeter of the given figure = $AB + BM + MD + DE + EN + NG + GH + HA$.

In questions 9 to 13, fill in the blanks to make the statements true.

Question 10

The amount of region enclosed by a plane closed figure is called its.....

Solution

Ans: The amount of region enclosed by a plane closed figure is called its Area.

Question 11

Area of a rectangle with length 5cm and breadth 3cm is.....

Solution

Ans: Area of rectangle = $L \times B$

$$= 5cm \times 3cm = 15cm^2$$

Question 12

A rectangle and a square have the same perimeter.

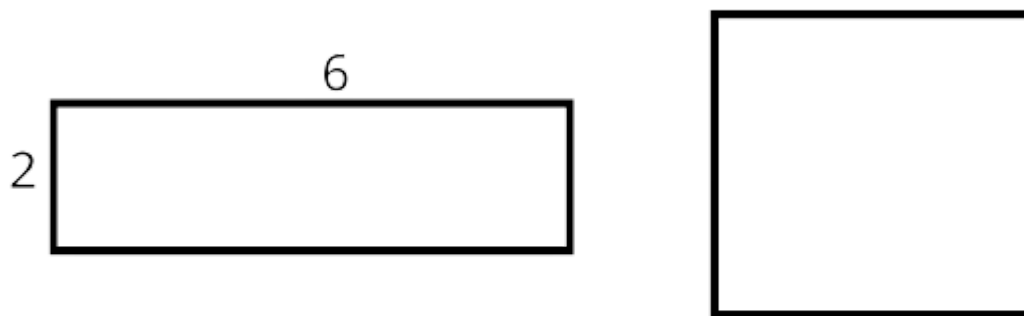


Fig. 6.10

(a) The area of the rectangle is.....

(b) The area of the square is.....

Solution

Ans: Area of rectangle = $L \times B$

$$= 6 \times 2 = 12unit^2$$

Ans: Given, a rectangle and a square have the same perimeter.

$$\text{So, } 2 \times (L + B) = 4 \times \text{sides}$$

$$\text{Side} = \frac{2(L + B)}{4}$$

$$\text{Side} = \frac{2(6 + 2)}{4}$$

$$\text{Side} = \frac{2 \times 8}{4}$$

$$\text{Side} = \frac{16}{4}$$

$$\text{Side} = 4 \text{ unit}$$

$$\text{Area of Square} = (\text{sides})^2$$

$$= (4 \text{ unit})^2 = 16 \text{ unit}^2$$

Question 13

(a) 1m = ... cm.

(b) 1sqcm = ...cm $\times$ 1cm.

(c) 1sqm = 1m $\times$ m = 100cm $\times$ cm.

(d) 1sqm = ...sq cm.

Solution

Ans: 1m = 100 cm.

Ans: 1sqcm = 1cm $\times$ 1cm.

Ans: 1 sqm = 1m $\times$ 1m = 100 cm $\times$ 100 cm.

Ans: 1 sqm = 10000 sq cm.

In questions 14 to 20, state which of the statements are true and which are false.

Question 14

If the length of a rectangle is halved and breadth is doubled then the area of the rectangle obtained remains the same.

Solution

Ans: True

Let. L and B are the length and breadth of the old rectangle and L' and B' length and breadth of the new rectangle.

Then, according to the question

$$L' = \frac{1}{2}L \text{ and } B' = 2B$$

So, the area of given rectangle = $L \times B$

$$\text{And area of new rectangle} = L' \times B' = \frac{1}{2}L \times 2B = L \times B$$

Hence, the area of the rectangle obtained remains the same.

Question 15

Area of a square is doubled if the side of the square is doubled.

Solution

Ans: False

Let, the side of square is A

$$\text{Then area of square} = A^2$$

According to the question, if the side of the square is doubled

$$\text{The side of new square is} = 2A$$

$$\text{And area of new square} = (2A)^2 = 4A^2$$

Question 16

Perimeter of a regular octagon of side 6cm is 36cm .

Solution

Ans: False

Sides = 8

So, perimeter Of hexagon = $8 \times \text{sides}$

$$8 \times 6 = 48\text{cm}$$

Question 17

A farmer who wants to fence his field must find the perimeter of the field.

Solution

Ans: True

Because ,perimeter is the measure of the boundary.

Question 18

An engineer who plans to build a compound wall on all sides of a house must find the area of the compound.

Solution

Ans: False

He must find the perimeters of the compound, not the area.

Question 19

To find the cost of painting a wall we need to find the perimeter of the wall.

Solution

Ans: False

Because, to find the cost of painting a wall we need to find the Area of the wall, not perimeter.

Question 20

To find the cost of a frame of a picture, we need to find the perimeter of the picture.

Solution

Ans: True

Because to find the cost of a frame of a picture, we need to find the perimeter of the picture.

Question 21

Four regular hexagons are drawn so as to form the design as shown in Fig. 6.11 If the perimeter of the design is 28cm , find the length of each side of the hexagon.

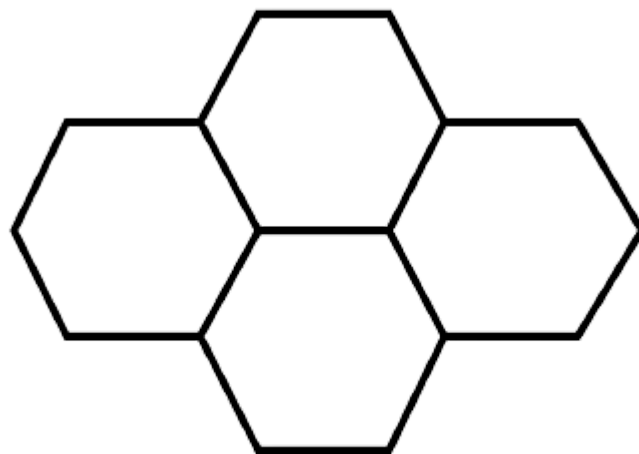


Fig. 6.11

Solution

Ans: Given, the perimeter of figure = $28cm$

No. of Sides=14

$$14 \times \text{side} = 28cm$$

$$\text{side} = \frac{28}{14}cm = 2cm$$

So, the length of each side of the hexagon is 2cm.

Question 22

The perimeter of an isosceles triangle is $50cm$. If one of the two equal sides is $18cm$, find the third side.

Solution

Ans: Given, perimeter = $50cm$

We know Perimeter = sum of all sides

$$50 = a + b + c$$

$$50 = 18 + 18 + c$$

$$50 = 36 + c$$

$$50 - 36 = c$$

$$14cm = c$$

Third side = $14cm$.

Question 23

The length of a rectangle is three times its breadth. The perimeter of the rectangle is $40cm$. Find its length and breadth.

Solution

Ans: Given, perimeter of the rectangle = 40cm

Let L and B are the length and breadth of rectangle

According to the question $L = 3B$

Perimeter of the rectangle = $2 \times (L + B)$

$$40 = 2 \times (3B + B)$$

$$40 = 2 \times 4B = 8B$$

$$\frac{40}{8} = B$$

$$5\text{cm} = B$$

$$\text{And length} = 3 \times 5 = 15$$

Question 24

There is a rectangular lawn 10m long and 4m wide in front of Meena's house (Fig. 6.12). It is fenced along the two smaller sides and one longer side leaving a gap of 1m for the entrance. Find the length of fencing.

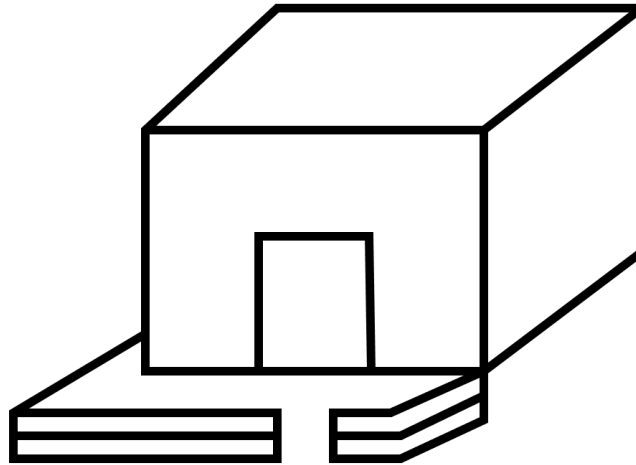


Fig. 6.12

Solution

Ans: In rectangular lawn length = 10m

And breadth = $4m$

Then the length of fenced along the two smaller sides of lawn

$$4m + 4m = 8m$$

$$\text{Total fencing} = 8m + 10m - 1m = 17m$$

Question 25

The region given in Fig. 6.13 is measured by taking a rectangle ($\square$) as a unit. What is the area of the region?

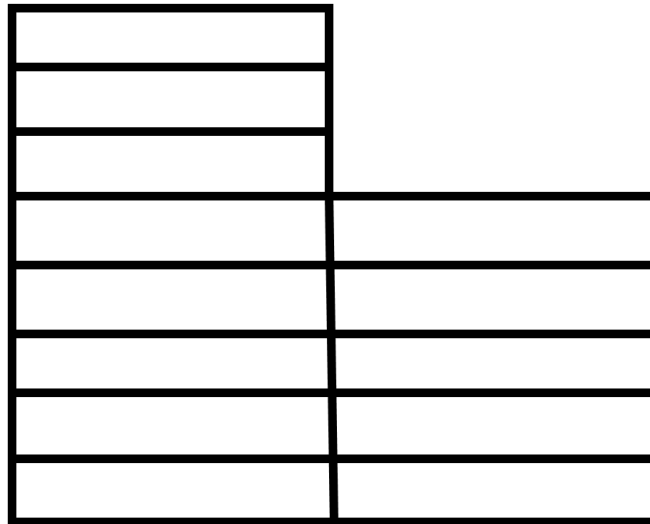


Fig. 6.13

Solution

Ans: There are 13 rectangular shapes in the figure

So, area of the region = 13 sq units

Question 26

Tahir measured the distance around a square field as 200 rods (lathi). Later he found that the length of this rod was 140cm. Find the side of this field in meters.

Solution

Ans: Given, the length of the rod = 140cm

Perimeter = the distance around a square field

$$4 \times \text{side} = \text{length of 200 rods}$$

$$4 \times \text{side} = 200 \times 140\text{cm}$$

$$\text{Side} = \frac{200 \times 140}{4}$$

$$= \frac{28000}{4} \text{ cm} = 7000 \text{ cm}$$

So, length of the side = 70 m

Question 27

The length of a rectangular field is twice its breadth. Jamal jogged around it four times and covered a distance of 6 km . What is the length of the field?

Solution

Ans: Let. L and B are the length and breadth of the rectangle.

Given, $L = 2B$

Perimeters = $2 \times (L + B)$

According to the question

$$4 \times [2 \times (L + B)] = 6 \text{ km}$$

$$4 \times [2(L + B)] = 6 \text{ km}$$

$$8 \times (2B + B) = 6 \text{ km}$$

$$8 \times 3B = 6 \text{ km}$$

$$24B = 6 \times 1000 \text{ m} = 6000 \text{ m}$$

$$B = \frac{6000}{24} \text{ m} = 250 \text{ m}$$

So, the length of the field = $2 \times 250 \text{ m} = 500 \text{ m}$

Question 28

Three squares are joined together as shown in Fig. 6.14. Their sides are 4 cm ; 10 cm and 3 cm . Find the perimeter of the figure.

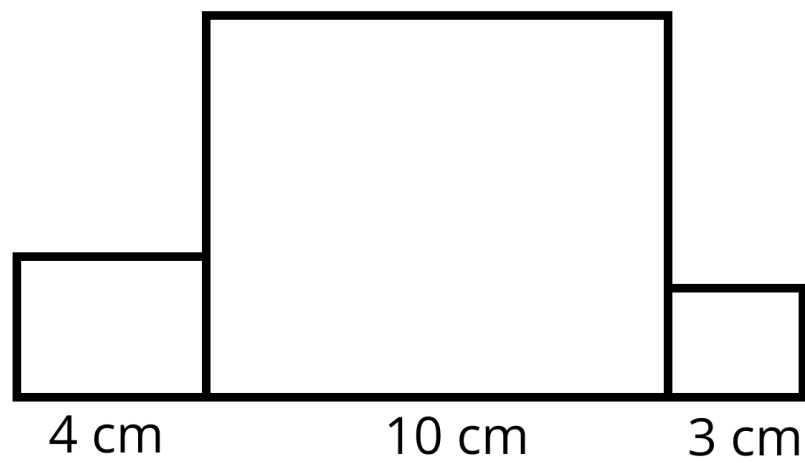
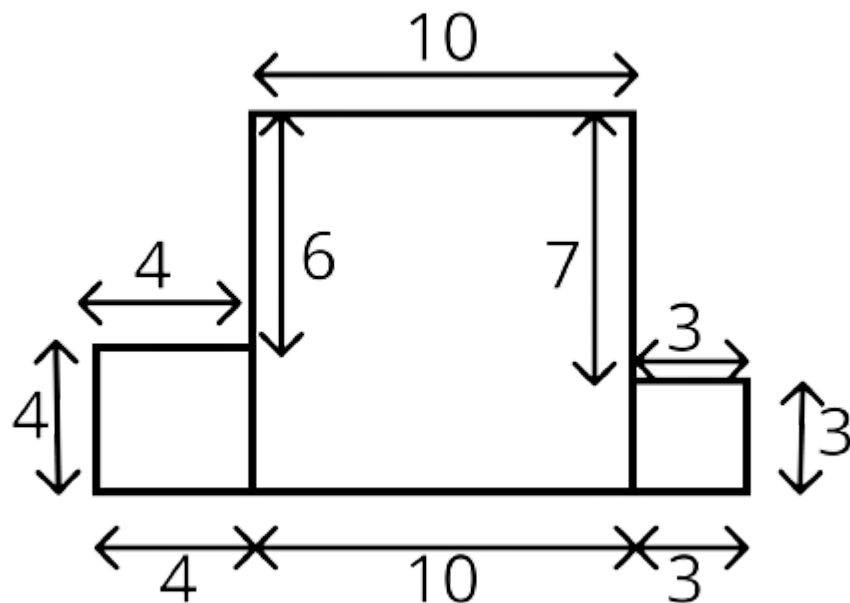


Fig. 6.14

Solution

Ans:



We know Perimeter = sum of all sides

$$\text{Perimeter} = 10 + 6 + 4 + 4 + 4 + 10 + 3 + 3 + 3 + 7 = 54\text{cm}$$

Question 29

In Fig. 6.15 all triangles are equilateral and $AB = 8$ units. Other triangles have been formed by taking the midpoints of the sides. What is the perimeter of the figure.

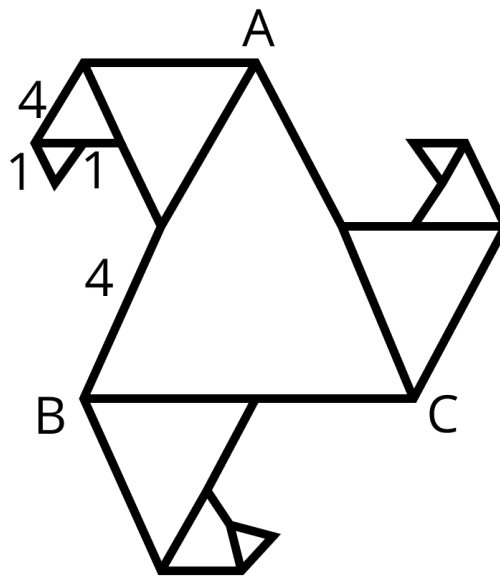
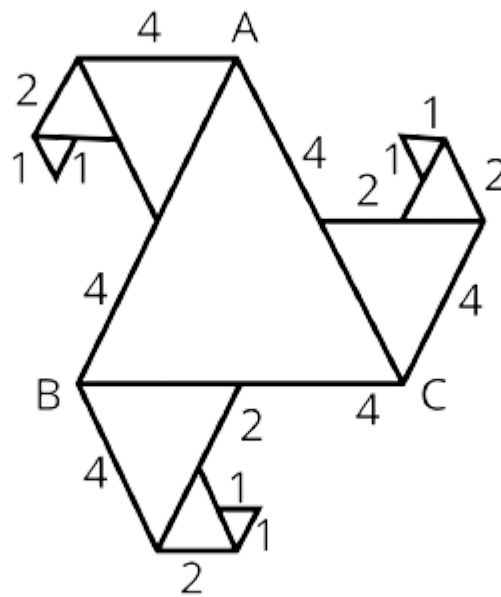


Fig. 6.15

Solution

Ans: Given, all the triangle are equilateral and $AB = 8$ unit



We know Perimeter = sum of all sides

Perimeter

$$= 4 + 2 + 1 + 1 + 1 + 2 + 4 + 4 + 2 + 1 + 1 + 1 + 2 + 4 + 4 + 2 + 1 + 1 + 1 + 2 + 4 = 45$$

units

Question 30

The length of a rectangular field is $250m$ and the width is $150m$. Anuradha runs around this field 3 times. How far did she run? How many times should she run around the field to cover a distance of $4km$?

Solution

Ans: Given, length (l) = $250m$

and width (b) = $150m$

$$\text{Then, perimeter of the field} = 2(l + b) = 2(250 + 150)m = 2 \times 400m = 800m$$

Because distance covered in one round = Perimeter = $800m$

So, distance covered in three rounds = $3 \times 800 = 2400m$

Now, number of rounds to cover $4km = \frac{4000}{800} = 5$

[$\because 1km = 1000m$]

So, she should run 5 times around the field to cover the distance of $4km$.

Question 31

Bajinder runs ten times around a square track and covers $4km$. Find the length of the track.

Solution

Ans: Given, length of track covered in 10 rounds = $4km = 4000m$ [$\because 1km = 1000m$]

So, length of track covered in 1 round = $\frac{4000}{10} = 400m$

Perimeter of square = $4 \times \text{side}$

So length of track = $\frac{400}{4} = 100m$

Question 32

The lawn in front of Molly's house is $12m \times 8m$, whereas the lawn in front of Dolly's house is $15m \times 5m$. Bamboo fencing is built around both the lawns. How much fencing is required for both?

Solution

Ans: Perimeter of the lawn in front of Molly's house

$$= 2 \times (L + B)$$

$$2 \times (12 + 8) = 2 \times 20 = 40m$$

Perimeter of the lawn in front of Dolly's house

$$= 2 \times (L + B)$$

$$2 \times (15 + 5) = 2 \times 20 = 40m$$

So, Fencing is required for both $= 40 + 40 = 80m$

Question 33

The perimeter of a regular pentagon is $1540cm$. How long is its every side?

Solution

Ans: Given, the perimeter of a regular pentagon $= 1540cm$

We know Perimeter = sum of all sides

Perimeter of the regular pentagon $= 5 \times \text{length of sides} = 1540cm$

$$\text{Sides} = \frac{1540}{5}cm = 308cm$$

So, length of the side of the regular pentagon is $308cm$.

Question 34

The perimeter of a triangle is $28cm$. One of its sides is $8cm$. Write all the sides of the possible isosceles triangles with these measurements.

Solution

Ans: Given, the perimeter of a triangle $= 28cm$

Let sides of a triangle are x, y and z

than $x = y, z = 8cm$

We know Perimeter = sum of all sides $= 28cm$

$$x + y + z = 28$$

$$x + x + 8 = 28$$

$$2x = 28 - 8$$

$$x = \frac{20}{2}$$

$$x = 10cm$$

Sides are $10cm$, $10cm$ and $8cm$

Let sides of a triangle are x, y and z

$$\text{And } x = y = 8cm$$

We know Perimeter = sum of all sides = $28cm$

$$x + y + z = 28$$

$$8 + 8 + z = 28$$

$$16 + z = 28$$

$$z = 28 - 16$$

$$z = 12cm$$

Sides are $8cm$, $8cm$ and $12cm$

Question 35

The length of an Aluminium strip is $40cm$. If the lengths in cm are measured in natural numbers, write the measurement of all the possible rectangular frames which can be made out of it. (For example, a rectangular frame with $15cm$ length and $5cm$ breadth can be made from this strip.)

Solution

Ans: Perimeter of rectangular frame = Length of the aluminum strip

$$2 \times (\text{length} + \text{breadth}) = 40cm$$

$$\text{Length} + \text{Breadth} = 20 \text{ cm}$$

$\therefore$ The possible measurement of rectangular frames are $1 \text{ cm} \times 19 \text{ cm}$, $2 \text{ cm} \times 18 \text{ cm}$, $3 \text{ cm} \times 17 \text{ cm}$, $4 \text{ cm} \times 16 \text{ cm}$, $5 \text{ cm} \times 15 \text{ cm}$, $6 \text{ cm} \times 14 \text{ cm}$, $7 \text{ cm} \times 13 \text{ cm}$, $8 \text{ cm} \times 12 \text{ cm}$, $9 \text{ cm} \times 11 \text{ cm}$, $10 \text{ cm} \times 10 \text{ cm}$

Question 36

The base of a tent is a regular hexagon of perimeter 60cm . What is the length of each side of the base?

Solution

Ans: Perimeter of hexagon = $6 \times \text{sides} = 60\text{cm}$

$$\text{Side} = \frac{60}{6} = 10\text{cm}$$

So, each side of the base is 10cm .

Question 37

In an exhibition hall, there are 24 display boards each of length $1\text{m}50\text{cm}$ and breadth 1m . There is a 100m long aluminium strip, which is used to frame these boards.

How many boards will be framed using this strip? Find also the length of the aluminium strip required for the remaining boards.

Solution

Ans: Length = $1\text{m}50\text{cm} = 1.5\text{m}$

Breadth = 1m

Then, perimeter of one display board = $2 \times (\text{length} + \text{breadth})$

$$2 \times (1.5\text{m} + 1\text{m})$$

$$2 \times 2.5\text{m} = 5\text{m}$$

So, perimeter of the display board = $5 \times 24 = 120\text{m}$

$$\text{Number of boards framed} = \frac{100}{5} = 20$$

And length of the aluminum strip required for the remaining boards = $(120 - 100)\text{m} = 20\text{m}$

Question 38

In the above question, how many square meters of cloth are required to cover all the display boards?
What will be the length in m of the cloth used, if its breadth is $120cm$?

Solution

Ans: Length = $1m50cm = 1.5m$

Breadth = $1m$

Area of the display board

$$24 \times (\text{length} \times \text{breadth}) = 24 \times 1.5m \times 1m = 36m^2$$

$36m^2$ cloths are needed to cover all the display boards.

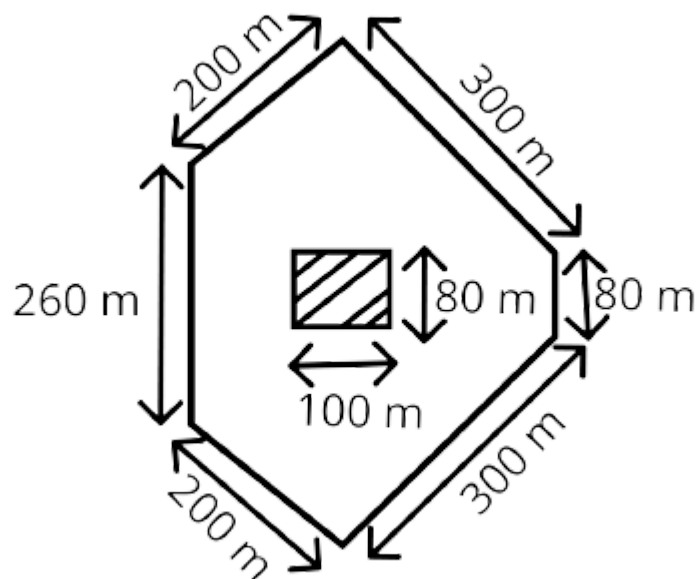
$$\text{Now, breadth of the cloth} = 120cm = \frac{120}{100}m = 1.2m$$

$$[\because 1m = 100cm]$$

$$\text{So, length of the cloth} = \frac{\text{area}}{\text{breadth}} = \frac{36m^2}{1.2m} = 30m$$

Question 39

What is the length of the outer boundary of the park shown in Figure, what will be the total cost of fencing it at the rate of Rs 20 per meter? There is a rectangular flower bed in the centre of the park. Find the cost of manuring the flower bed at the rate of Rs 50 per square meter.



Solution

Ans: We know Perimeter = sum of all sides

$$\text{Perimeter} = (200 + 300 + 80 + 300 + 200 + 260)m = 1340m$$

Then, rate of fencing it at the rate of Rs 20 per meter

$$= \text{Rs. } (1340 \times 20) = \text{Rs. } 26800$$

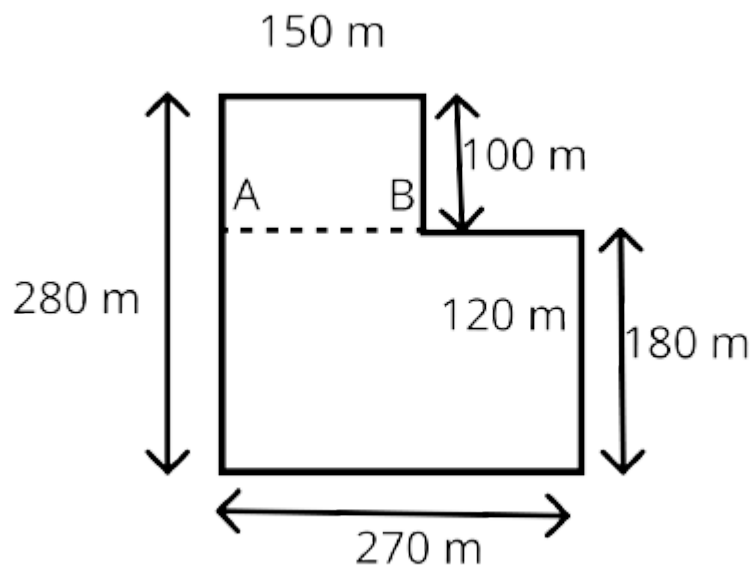
$$\text{Area of the flower bed} = (100 \times 80)m^2 = 8000m^2$$

Also, rate of manuring the flower bed per square metre = Rs 50 per square meter

$$\text{Then, rate of manuring the flower bed per 8000 square meter} = \text{Rs. } (50 \times 8000) = \text{Rs. } 400000$$

Question 40

Total cost of fencing the park shown in Figure is Rs 55000. Find the cost of fencing per meter.



Solution

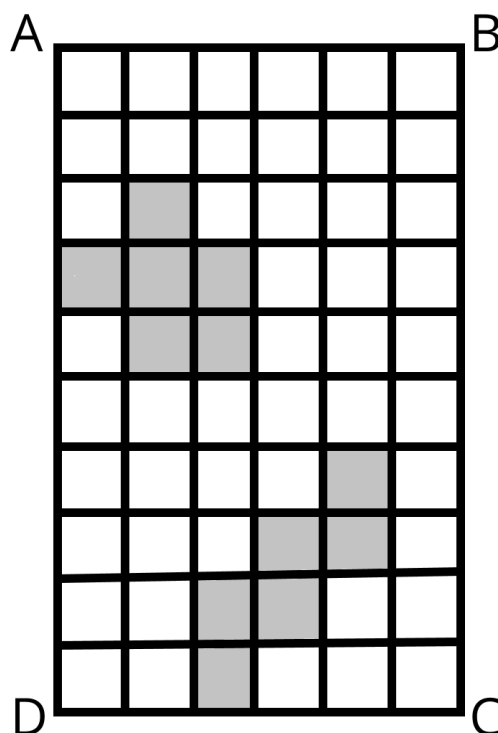
Ans: We know Perimeter = sum of all sides

$$\text{Perimeter} = 150 + 100 + 120 + 180 + 270 + 280 = 1100m$$

$$\text{Now cost of fencing the per meter} = \frac{\text{Total cost of fencing}}{\text{Perimeter of the park}} = \text{Rs.} \left(\frac{55000}{1100} \right) = \text{Rs.} 50$$

Question 41

In Figure each square is of unit length



(a) What is the perimeter of the rectangle $ABCD$?

(b) What is the area of the rectangle $ABCD$?

(d) Find the perimeter of each part which you have divided. Are they all equal?

Solution

Ans: Given that each square is of unit length, $ABCD$ is 10 units and breadth is 6 units

Perimeter of $ABCD = 2 \times (\text{length} + \text{breadth})$

$$= 2 \times (10 + 6) \text{ units} = 2 \times 16 \text{ units} = 32 \text{ units}$$

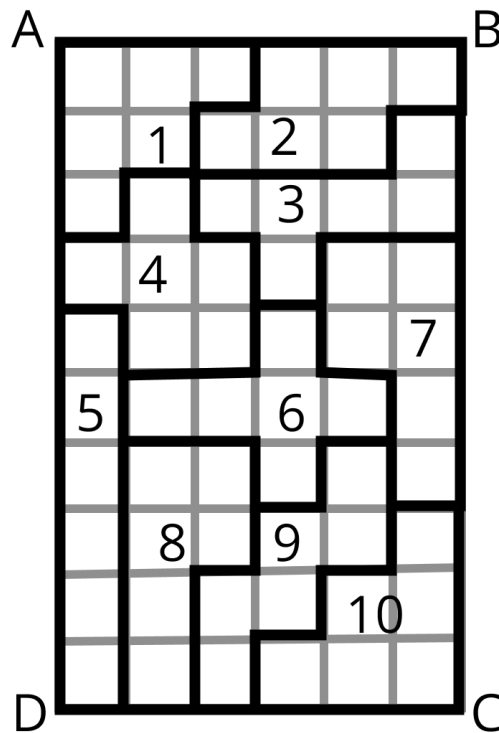
Ans: Area of rectangle $ABCD = \text{length} \times \text{breadth}$

$$(10 \times 6) \text{ units}^2 = 60 \text{ units}^2$$

(c) Divide this rectangle into ten parts of the equal area by shading squares.

(Two parts of equal area are shown here)

Ans: The figure shows the part of the rectangle of the equal area by shading squares 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10.



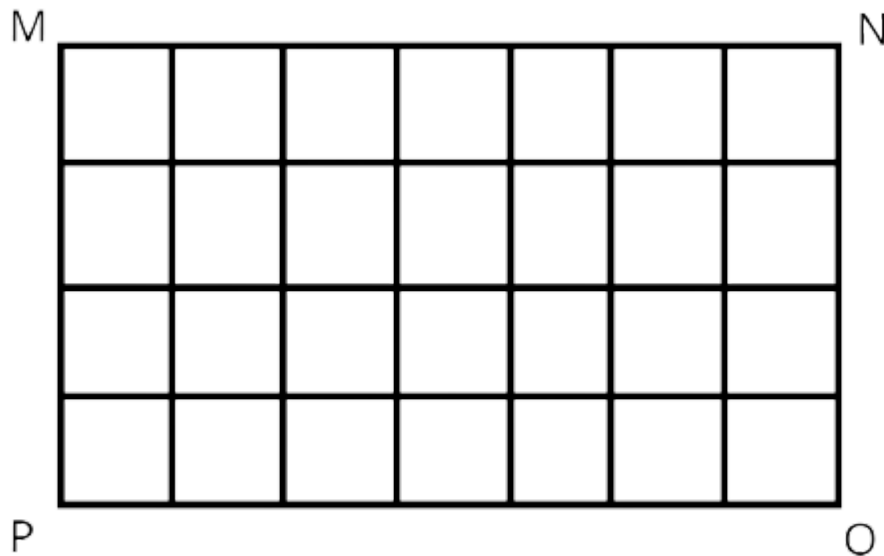
Ans: For 1,2,4,7,8 & 10 parts, Perimeter is 12 units.

For 3,5,6 & 9 Perimeter is 14 units.

No, they are not equal.

Question 42

Rectangular wall MNOP of a kitchen is covered with square tiles of 15cm length (in Figure). Find the area of the wall.



Solution

Ans: Area of square tile = $15 \times 15 = 225 \text{ cm}^2$

Number of tile = 28 square

So, area of the wall = $(225 \times 28) \text{ cm}^2 = 6300 \text{ cm}^2$

Question 43

The length of a rectangular field is 6 times its breadth. If the length of the field is 120 cm , find the perimeter of the field.

Solution

Ans: Given, Length (L) = 120 cm and breadth = B

Then, $L = 6B$

$$B = \frac{120}{6} = 20 \text{ cm}$$

Perimeter of the rectangle = $2 \times (L + B)$

$$2 \times (120 + 20) = 2 \times 140 = 280 \text{ cm}$$

Question 44

Anmol has a chart paper measuring $90\text{cm} \times 40\text{cm}$, whereas Abhishek has one which measures $50\text{cm} \times 70\text{cm}$. Which will cover more area on the table and by how much?

Solution

Ans: The area of the Anmol's chart paper $= (90\text{cm} \times 40\text{cm}) = 3600\text{cm}^2$

The area of the Abhishek's chart paper $= (50\text{cm} \times 70\text{cm}) = 3500\text{cm}^2$

So, Anmol will cover more area on the table and by how 100 cm^2 .

Question 45

A rectangular path of 60m length and 3m width is covered by square tiles of side 25cm . How many tiles will there be in one row along its width? How many such rows will be there? Find the number of tiles used to make this path?

Solution

Ans: Given length (L) $= 60\text{m} = 6000\text{cm}$

Width(B) $= 3\text{m} = 300\text{cm}$

Side of the square tile $= 25\text{cm}$

Number of tiles in one row along width

$$\frac{\text{width of the path}}{\text{side of the a tile}} = \frac{300}{25} = 12$$

$$\text{Number of the rows} = \frac{\text{length of the path}}{\text{side of a tile}} = \frac{6000}{25} = 240$$

$$\text{Number of tiles} = 12 \times 240 = 2880$$

Question 46

How many square slabs each with side 90cm are needed to cover a floor of area 81sqm .

Solution

Ans: Given, side of square slab = 90cm

$$\text{Area of square slab} = (90\text{cm})^2 = 8100\text{cm}^2$$

$$\begin{aligned}\text{And, area of the floor} &= 81\text{m}^2 = 81 \times 10000\text{cm}^2 \\ &= 810000\text{cm}^2\end{aligned}$$

$$\text{Number of slab} = \frac{\text{Area of the floor}}{\text{Area of square slab}}$$

$$= \frac{810000}{8100} = 100 \text{ slabs}$$

Question 47

The length of a rectangular field is 8m and breadth is 2m . If a square field has the same perimeter as this rectangular field, find which field has the greater area.

Solution

Ans: Given, length (L) = 8m

Width (B) = 2m

$$\text{Then, perimeter} = 2(L + B) = 2(8 + 2) = 2 \times 10 = 20\text{m}$$

$$\text{And, area} = L \times B = 8 \times 2 = 16\text{m}^2$$

According to the question

Perimeter = Perimeter of a rectangular

$$4 \times \text{Side} = 20$$

$$\text{Side} = \frac{20}{4} = 5\text{m}$$

$$\text{Now, area of square} = \text{Side} \times \text{Side} = 5 \times 5 = 25\text{m}^2$$

Hence, the area of a square field is greater than the area of a rectangular field.

Question 48

Parminder walks around a square park once and covers $800m$. What will be the area of this park?

Solution

Ans: Given , perimeter of the square $= 800m = 4 \times \text{sides}$

$$800m = 4 \times \text{sides}$$

$$\text{side} = \frac{800}{4} = 200m$$

$$\text{And area of square} = \text{Side} \times \text{Side} = (200m)^2 = 40000m^2$$

Question 49

The side of a square is $5cm$. How many times does the area increase, if the side of the square is doubled?

Solution

Ans: Given, side of square $= 5cm$

$$\text{Then, area of square} = \text{Side} \times \text{Side} = 5 \times 5 = 25cm^2 \dots (i)$$

According to the question

$$\text{New side} = 2 \times \text{old side}$$

$$= 2 \times 5 = 10cm$$

$$\text{Now, area of square} = 10 \times 10 = 100cm^2$$

By, (i) and (ii) area of the new square is increased by 4 times.

Question 50

Amita wants to make rectangular cards measuring $8\text{cm} \times 5\text{cm}$. She has a square chart paper of 60cm . How many complete cards can she make from this chart? What area of the chart paper will be left?

Solution

Ans: Given, area of square chart = $60 \times 60 = 3600\text{cm}^2$

Length of the chart is 60cm and in that 7 cards of 8cm length she can make and for width 60cm she can make exactly 12 cards of length 5cm .

So total no. of cards = $12 \times 7 = 84$

And area of card = $8 \times 5 = 40\text{cm}^2$

The area of left part of square chart = $3600 - (84 \times 40) = 240\text{cm}^2$

Question 51

A magazine charges Rs 300 per 10sqcm area for advertising. A company decided to order a half-page advertisement. If each page of the magazine is $15\text{cm} \times 24\text{cm}$, what amount will the company has to pay for it?

Solution

Ans: Area of one page of the magazine = $15\text{cm} \times 24\text{cm} = 360\text{cm}^2$

Then, area of half page of the magazine = $\frac{360}{2}\text{cm}^2 = 180\text{cm}^2$

Cost of advertising for $10\text{cm}^2 = \text{Rs.} 300$

Cost of advertising for $1\text{cm}^2 = \frac{\text{Rs.} 300}{10}$

Cost of advertising for $180\text{cm}^2 = \text{Rs.} \frac{300}{10} \times 180$

= $\text{Rs.} 30 \times 180 = \text{Rs.} 5400$

Question 52

The perimeter of a square garden is $48m$. A small flower bed covers the $18sqm$ area inside this garden. What is the area of the garden that is not covered by the flower bed? What fractional part of the garden is covered by the flower bed? Find the ratio of the area covered by the flower bed and the remaining area.

Solution

Ans: Given perimeter of the square garden $= 48m = 4 \times \text{side}$

$$\text{side} = \frac{48}{4} = 12m$$

Now, area of square garden $= \text{Side} \times \text{Side} = 12 \times 12 = 144m^2$

Also, given area of small flower bed $= 18m^2$

Then, area of the garden not covered with flower bed $= 144 - 18 = 126m^2$

Now, the fractional part of the garden covered by the flower bed

$$= \frac{\text{Area of flower bed}}{\text{Area of the square garden}} = \frac{18}{144} = \frac{1}{8}$$

In addition, the ratio of the area covered by the flower bed and the remaining area $= \frac{18}{126} = \frac{1}{7}$ i.e.
1 : 7

Question 53

The perimeter of a square and a rectangle is the same. If a side of the square is $15cm$ and one side of the rectangle is $18cm$, find the area of the rectangle.

Solution

Ans: Given, side of the square $= 15cm$, length of the rectangle $= 18cm$

According to the question

Also given, perimeter of the square $=$ perimeter of the rectangle $=$

$$4 \times \text{sides} = 2 \times (\text{length} + \text{breadth})$$

$$4 \times 15 = 2 \times (18 + \text{breadth})$$

$$60 = 2 \times (18 + \text{breadth})$$

$$\text{breadth} = 30 - 18 = 12\text{cm}$$

$$\text{Now, area of the rectangular} = 18 \times 12 = 216\text{cm}^2$$

$$\text{Area of square} = 15^2\text{cm}^2 = 225\text{cm}^2$$

Question 54

A wire is cut into several small pieces. Each of the small pieces is bent into a square of side 2cm . If the total area of the small squares is 28 square cm , what was the original length of the wire?

Solution

Ans: Given, square of side = 2cm

$$\text{Length of one piece} = \text{Perimeter of the square} = 4 \times 2\text{cm} = 8\text{cm}$$

Let the number of pieces = n

According to the question

$$n \times (\text{side})^2 = 28$$

$$n \times (2)^2 = 28$$

$$n = \frac{28}{4} = 7$$

The original length of the wire = Number of pieces $\times$ length of one piece

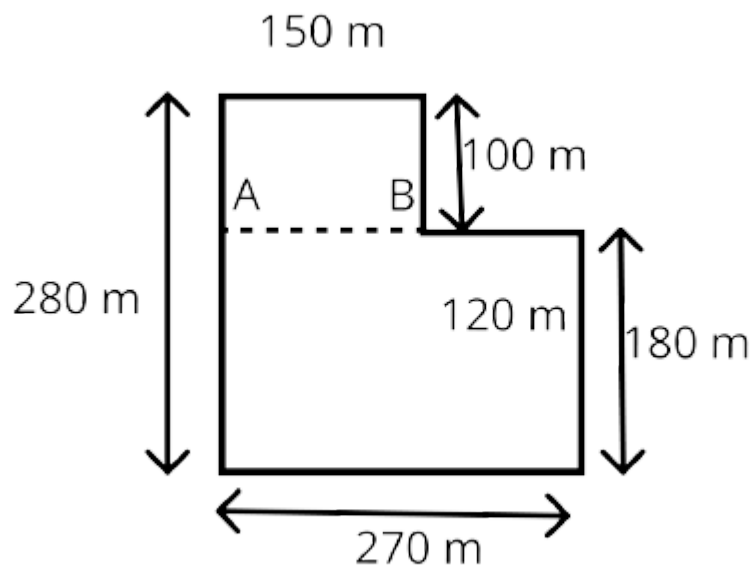
$$= 7 \times 8 = 56\text{cm}$$

Question 55

Divide the park shown in Fig. 14 of question 40 into two rectangles. Find the total area of this park. If one packet of fertilizer is used for 300sqm , how many packets of fertilizer are required for the whole park?

Solution

Ans:



Total area of the park = $(150 \times 100) + (270 \times 180)$

$$= 15000 + 48600 = 63600m^2$$

Now one packet of fertilizer used for area = $300m^2$

$$\text{Than, number of total packets} = \frac{63600}{300} = 212$$

Question 56

The area of a rectangular field is $1600sqm$. If the length of the field is $80m$, find the perimeter of the field.

Solution

Ans: Given, area of a rectangular field = $1600m^2$

And length = $80m$

Now, area = $length \times breadth$

$$80 \times breadth = 1600$$

$$breadth = \frac{1600}{80}$$

$$= 20m$$

Now, perimeter of rectangular field = $2(length + breadth)$

$$= 2(80 + 20) = 200m$$

Question 57

The area of each square on a chess board is $4sqcm$. Find the area of the board.

(a) At the beginning of the game when all the chess men are put on the board, write the area of the squares left unoccupied.

(b) Find the area of the squares occupied by chess men.

Solution

Ans: Given, the area of the square on a chess board = $4cm^2$

There are 64 squares on a chess board.

$$\text{So, area of the chess board} = 64 \times 4sqcm = 256cm^2$$

$$\text{Area of the squares left unoccupied in the beginning} = 32 \times \text{area of a square} = 32 \times 4 = 128cm^2$$

$$\text{Ans: Area of the squares occupied by chessmen} = 32 \times \text{area of one square} = 32 \times 4 = 128cm^2$$

Question 58

(a) Find all the possible dimensions (in natural numbers) of a rectangle with a perimeter $36cm$ and find their areas.

(b) Find all the possible dimensions (in natural numbers) of a rectangle with an area of $36sqcm$, and find their perimeters.

Solution

Ans: Perimeter of the rectangle = $36cm$

$$2 \times (\text{length} + \text{breadth}) = 36\text{cm}$$

$$(\text{length} + \text{breadth}) = \frac{36}{2} = 18\text{cm}$$

Then, the possible dimension of the rectangle and their area as follows:

Dimension	Area
1×17	17cm^2
2×16	32cm^2
3×15	45cm^2
4×14	56cm^2
5×13	65cm^2
6×12	72cm^2
7×11	77cm^2
8×10	80cm^2
9×9	81cm^2

Ans: Area of a rectangle = $\text{length} \times \text{breadth} = 36\text{cm}^2$

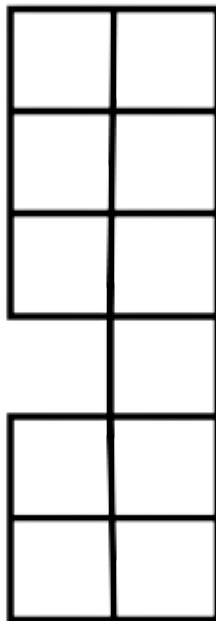
Then, the possible dimension of the rectangle and their area as follows:

Dimension	Perimeters
1×36	74cm
2×18	40cm

3×12	30cm
4×9	26cm
6×6	24cm

Question 59

Find the area and perimeter of each of the following figures, if the area of each small square is 1sqcm.



(i)

Solution

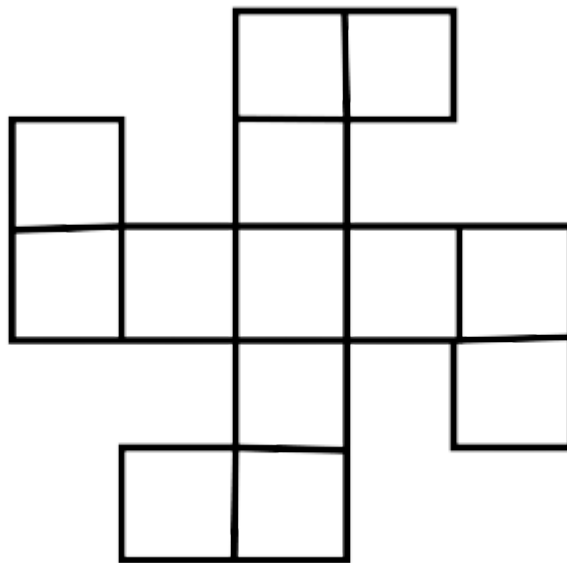
Ans: Given, area of each small square = 1cm^2

And there are 11 small squares.

So, area = $11 \times 1 = 11\text{cm}^2$

Perimeter = sum of all sides

Perimeter = 18cm



(ii)

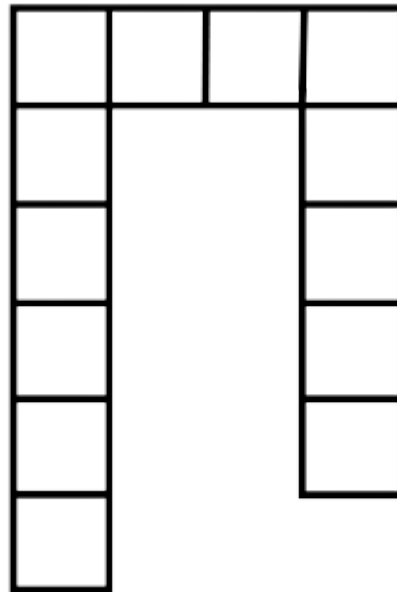
Ans: Given, area of each small square = 1cm^2

And there are 13 small squares.

So, area = $13 \times 1 = 13\text{cm}^2$

Perimeter = sum of all sides

Perimeter = 28cm



(iii)

Ans: Given, area of each small square = 1cm^2

And there are 13 small squares.

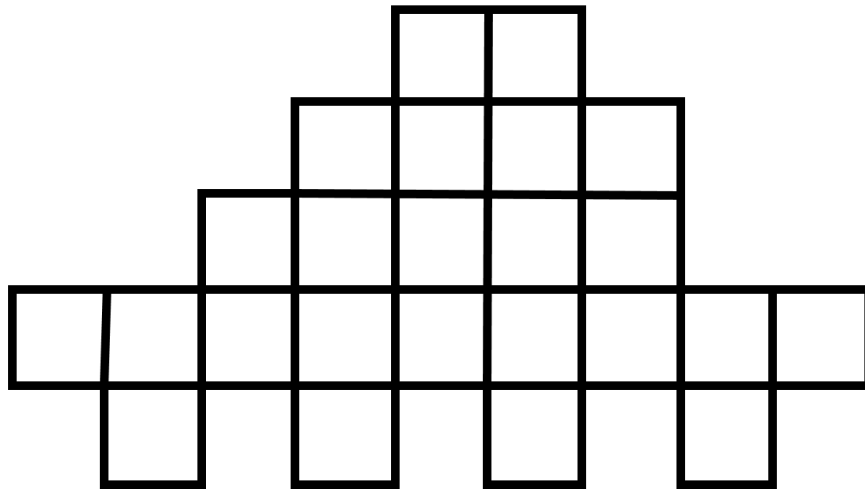
So, area = $13 \times 1 = 13\text{cm}^2$

Perimeter = sum of all sides

Perimeter = 28cm

Question 60

What is the area of each small square in the Figure if the area of the entire figure is 96sqcm . Find the perimeter of the figure.



Solution

Ans: Given, area of the figure = $96cm^2$

Total no. of small square in the given figure = 24

So, area of each small square = $\frac{96}{24} = 4cm^2$

Now, side of each small square = $2cm$

Perimeter of the figure = $34 \times 2 = 68cm$