Exercise

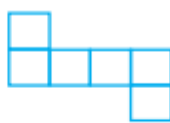**In questions 1 to 6, out of the four options only one is correct. Write the correct answer.**

1. **Following figures are formed by joining six unit squares. Which figure has the smallest perimeter in Fig. 6.4?**

Fig. 6.4

(A) (ii)   **(B) (iii)**   **(C) (iv)**   **(D) (i)**

Solution:

Consider the given figures,

(i) figure (i) has 10 units and each side have length 1 cm

So, perimeter = 10 × 1

= 10 cm

(ii) figure (ii) has 12 units and each side have length 1 cm

So, perimeter = 12 × 1

= 12 cm

(iii) figure (iii) has 14 sides and each side have length 1 cm

So, perimeter = 14 × 1

= 14 cm

(iv) figure (iv) has 14 sides and each side have length 1 cm

So, perimeter = 14 × 1

= 14 cm

It can be clearly seen that the perimeter of figure (i) is the greatest.

So, option (D) is correct.

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

(A) 360m   (B) 400m   (C) 340m   (D) 460m
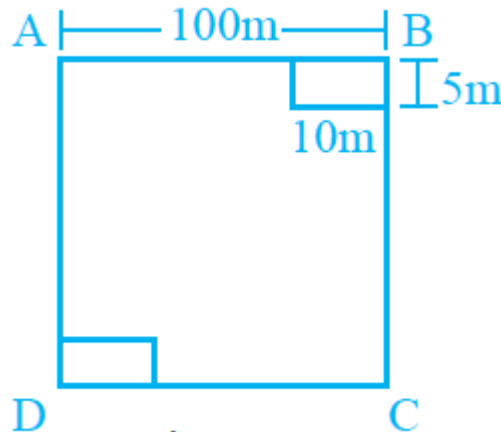

Fig. 6.5

Solution:

Given, side of square shaped park = 100 m

Size of rectangular flower bed = 10m × 5m

Now, length of the boundary of the remaining park = 90+5+10+95+90+5+10+95

$$= 400m$$

So, option (D) is correct.

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:

Given, side of square = 10cm

So, perimeter of square = 10×4

$$= 40cm$$

Now side of square becomes = 10×2

$$= 20 \text{ cm}$$

Now, perimeter of the same square becomes $= 20 \times 4$

$$= 80 \text{cm}$$

It can be seen clearly that the perimeter of the square gets double when the side of the square is doubled.

So, option (A) is correct.

4. Length and breadth of a rectangular sheet of paper are 20cm and 10cm, 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?
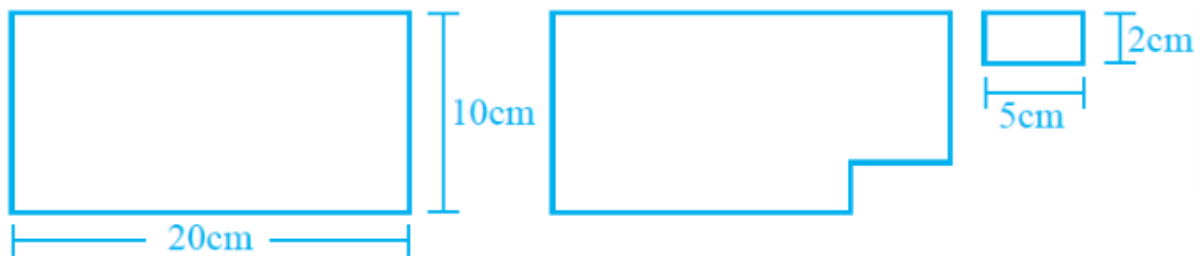

Fig. 6.6

(A) Perimeter remains same but area changes.

(B) Area remains the same but perimeter changes.

(C) Both area and perimeter are changing.

(D) Both area and perimeter remain the same.

Solution:

If a rectangular piece is cut from the rectangular sheet as given, the perimeter of the rectangular sheet will remain same but the area will change.

So, option (A) is correct.

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

(A) 65cm   (B) 60cm   (C) 55cm   (D) 50cm
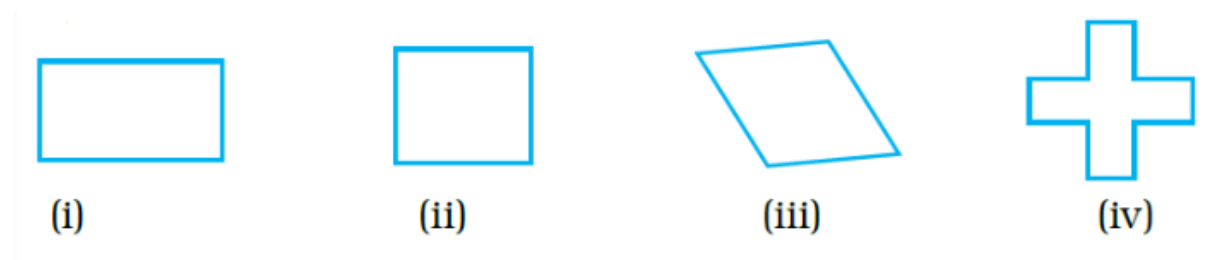
Fig. 6.7

Solution:

Perimeter of given Hexagon = 30cm

This implies side of Hexagon = $\dfrac{30}{6}$

$= 5\text{cm}$

Now, the perimeter of new figure formed $= (5 \times 5) + (5 \times 5)$

$= 25 + 25$

$= 50\text{cm}$

So, option (D) is correct.

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

(i)   (ii)   (iii)   (iv)

(A) (i)   (B) (ii)   (C) (iii)   (D) (iv)

Solution:

Regular polygon is the one which has all sides and angles equal.

So, option (B) is correct.

7. Match the shapes (each sides measures 2cm) in column I with the corresponding perimeters in column II:

Column I	Column II
(A)	(i) 16cm
(B)	(ii) 20cm
(C)	(iii) 24cm
(D)	(iv) 28cm
	(v) 32cm

Solution:

(A) Given figure has 14 sides, this implies its perimeter $= 14 \times 2$

$$= 28 \text{ cm}$$

So, (A) matches (iv).

(B) Given figure has 8 sides, this implies its perimeter $= 8 \times 2$

$$= 16 \text{ cm}$$

So, (B) matches (i).

(C) Given figure has 10 sides, this implies its perimeter $= 10 \times 2$

$$= 20 \text{ cm}$$

So, (C) matches (ii).

(D) Given figure has 12 sides, this implies its perimeter $= 12 \times 2$

$$= 28 \text{ cm}$$

So, (D) matches (iii).

Matches are as follows:

(A)-(iv)

(B)-(i)

(C)-(ii)

(D)-(iii)

8. Match the following:

Shapes	Perimeter
(A) rectangle (with sides 6 and 4)	(i) 10
(B) square (with side 5)	(ii) 18
(C) equilateral triangle (sides 6, 6, 6)	(iii) 20
(D) isosceles triangle (sides 4, 4, 2)	(iv) 25

Solution:

(A) Given figure is rectangle with size $= 6 \times 4 \, \text{unit2}$

This implies its perimeter $= 2(6 + 4)$

$= 20 \text{units}$

So, (A) matches (iii).

(B) Given figure is square with size = 5×5 unit2

This implies its perimeter = 4×5 units

= 20units

So, (B) matches (iii).

(C) Given figure is equilateral triangle with side = 6 units

This implies its perimeter = 6×3

= 18units

So, (C) matches (ii).

(D) Given figure is isosceles triangle with sides = 4 units and 2 units

This implies its perimeter = $4 + 4 + 2$

= 10units

So, (D) matches (i).
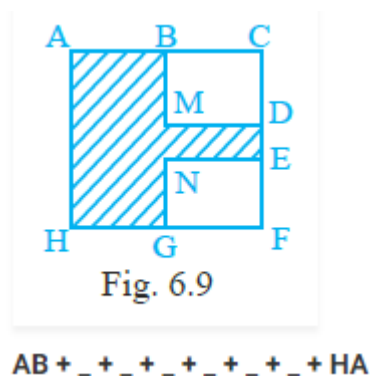

Matches are as follows:

(A)-(iii),

(B)-(iii),

(C)-(ii),

(D)-(i).

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

9. Perimeter of the shaded portion in Fig. 6.9 is

Fig. 6.9

AB + _ + _ + _ + _ + _ + _ + HA

Solution:

Perimeter of the shaded portion in given figure is = AB + BM + MD + DE + EN + NG + GH + HA respectively.

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

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

Solution:

Region enclosed by any plane closed figure is called its area.

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

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

Solution:

Area of rectangle = length $\times$ breadth

$\qquad\qquad$ = 5cm $\times$ 3 cm

$\qquad\qquad$ = 15cm

Area of a rectangle with length 5cm and breadth 3cm is 15 square cm.

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 _____.

Fig. 6.10

Solution:

Given, Perimeter of rectangle = perimeter of square

Let side of square be a

This implies, $2(6 + 2) = 4 \times a$

$$a = 4\text{cm}$$

Now, area of rectangle $= 6 \times 2$

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

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

$$= (4)^2$$

$$= 16 \text{ cm}^2$$

(a) The area of the rectangle is <u>12 cm^2</u>.

(b) The area of the square is <u>16 cm^2</u>.

13. (a) 1m = _____ cm.

(b) 1sqcm = _____ cm × 1cm.

(c) 1sqm = 1m × _____ m = 100cm × _____ cm.

(d) 1sqm = _____ sqcm.

Solution:

(a) 1 m = <u>100</u> cm.

(b) 1sqcm = <u>1</u> cm × 1 cm.

(c) 1sqm = 1 m × <u>1</u> m = 100 cm × <u>100</u> cm.

(d) 1sqm = <u>10000</u> sqcm.

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

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

Solution:

Yes, the area of the rectangle obtained remains same when length of a rectangle is halved and breadth is doubled.

So, given statement is **true**.

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

Solution:

Area of a square becomes four times if the side of the square is doubled.

So, given statement is **False**.

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

Solution:

Perimeter of a regular octagon of side 6cm is 48cm.

So, given statement is **False**.

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

Solution:

Yes, fencing is done around the boundary of farm and so farmer who wants to fence his field, must find the perimeter of the field.

So, given statement is **true**.

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

Solution:

No, an engineer who plans to build a compound wall on all sides of a house must not find the area of the compound.

So, given statement is **False**.

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

Solution:

No, in order to find the cost of painting a wall we need to find the area of the wall.

So, given statement is **False**.

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

Solution:

Yes, in order to find the cost of a frame of a picture, we need to find the perimeter of the picture.

So, given statement is **true**.

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:

Given, perimeter of the given figure = 28cm

Also no. of sides of given figure = 14

So, length of each side = $\dfrac{28}{14}$

$= 2$cm

22. Perimeter of an isosceles triangle is 50cm. If one of the two equal sides is 18cm, find the third side.

Solution:

Given, perimeter of an isosceles triangle = 50 cm

One of the two equal sides = 18 cm

Let third side of the isosceles triangle be a.

So, we have

18 + 18 + a = 50

This implies, a = 50 – (36)

a = 14 cm

So, third side of isosceles triangle = 14cm respectively.

23. Length of a rectangle is three times its breadth. Perimeter of the rectangle is 40cm. Find its length and width.

Solution:

Given, Length of a rectangle = three times its breadth

Perimeter of rectangle = 40cm

Now let length and breadth of rectangle be l and b respectively.

So, we have 2(l + b) = 40

2(3b + b) = 40

4b = 20

b = 5 cm

Hence length = 3 × 5

= 15 cm

So, length and breadth of rectangle are 15cm and 5cm.

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.
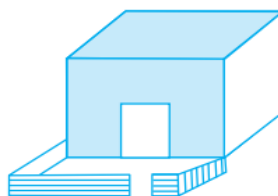

Fig. 6.12

Solution:

Given, size of rectangular lawn is 10m and 4m.

Gap for entrance = 1m

Length of fencing = 4 + 4 + 9

= 17m

25. The region given in Fig. 6.13 is measured by taking [_____] as a unit. What is the area of the region?
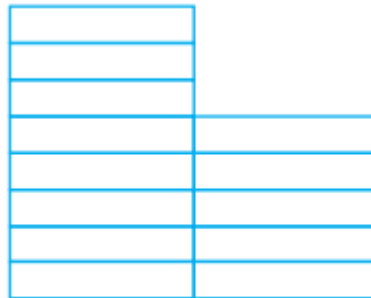

Fig. 6.13

Solution:

Area of one rectangular block = 1 square unit

Total no. of rectangular blocks = 13

Area of the region = 13 × 1

= 13 square unit

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 metres. Now

Solution:

Given, distance around a square field = 200 rods

Length of rod = 140cm

= 1.4m

Now the side of this field in metres = 1.4 × 200

= 280m

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

Solution:

Given, length of a rectangular field = twice its breadth

Let length and breadth of rectangular field be l and b respectively.

Now, Perimeter of rectangular field = 2(l + b)

This implies, $4 \times 2(2b + b) = 6$

$$4 \times 6b = 6$$

$$4b = 1$$

$$b = 0.25 \text{ km}$$

$$b = 250 \text{ m}$$

So, length of field = 250×2

$$= 500 \text{ m}$$

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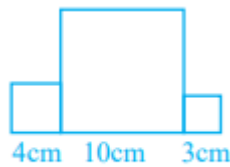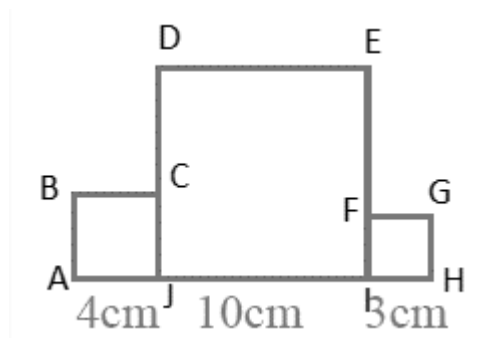

Fig. 6.14

Solution:

Sides of the three given squares = 4cm, 10cm and 3cm

Perimeter of figure = sum of all sides

$$= AB + BC + CD + DE + EF + FG + GH + HI + JI + JA$$

$$= 4 + 4 + (10 - 4) + 10 + (10 - 3) + 3 + 3 + 3 + 10 + 4$$

$$= 54 \text{ cm}$$

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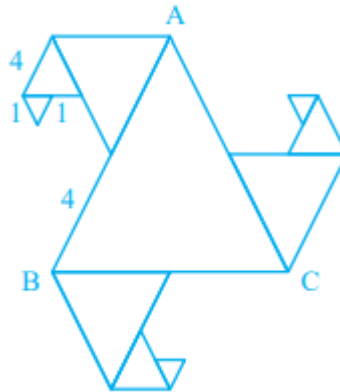

Fig. 6.15

Solution:

Given, all triangles in the given figure are equilateral and AB = 8 units

Perimeter of the given figure

= 4 + 2 + 1 + 1 + 1 + 2 + 4 + 4 + 2 + 1 + 1 + 1 + 2 + 4 + 4 + 2 + 1 + 1 + 1 + 2 + 4

= 45 units

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

Solution:

Given, Length of a rectangular field = 250m

Width of rectangular field = 150 m

Now, Perimeter of rectangle = 2(length + breadth)

= 2 × (250 + 150)

= 2 × 400

= 800 m

Also given, Anuradha runs around this field 3 times = 3 × 800

= 2400 m

= 2.4 km

Therefore, Number of times Anurudha should run around the field to cover a distance of 4km

$= \dfrac{4000}{800}$

= 5

Hence, Anurudha should run 5 times around the field to cover a distance of 4km.

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

Solution:

Let a be the side of the square track.
Perimeter of the square track = 4a
Bajinder runs ten times around the square track and covers 4 km.
i.e., $10 \times 4a = 4$ km
$40a = 4 \times 1000$ m [∵ 1 km = 1000 m]

$$a = \frac{4 \times 1000}{40}\text{m}$$
$$= 100\text{m}$$

Length of the track = 4a
$$= 4 \times 100 \text{ m} = 400 \text{ m}$$

32. The lawn in front of Molly's house is 12m× 8m, whereas the lawn in front of Dolly's house is 15m×5m. A bamboo fencing is built around both the lawns. How much fencing is required for both?

Solution:

Given, size of lawn in front of Molly's house = 12m× 8m

Size of lawn in front of Dolly's house = 15m×5m

Now fencing required for both = 2(12 + 8) + 2(15 + 5)

$$= 40 + 40$$

$$= 80\text{m}$$

33. The perimeter of a regular pentagon is 1540cm. How long is its each side?

Solution:

Given, perimeter of pentagon = 1540cm

Sides in pentagon = 5

5 x side = 1540

Now, length of each side $= \dfrac{1540}{5}$

= 308 cm

34. The perimeter of a triangle is 28cm. One of it's sides is 8cm. Write all the sides of the possible isosceles triangles with these measurements.

Solution:

Given, Perimeter of a triangle = 28cm

One of its sides = 8cm

Let two equal sides of isosceles triangle be a

Now we have, a + a + 8 = 28

$$2a + 8 = 28$$

$$2a = 20$$

$$a = 10cm$$

All sides of isosceles triangle are 8cm, 10cm, and 10cm.

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:

Given length of aluminium strip = 40cm

This implies, we have perimeter of rectangular frame = 40cm

Now 2(l + b) = 40

$$l + b = 20$$

From this equation we can suggest innumerable values of l and b as 19×1cm, 18×2 cm, 16×4 cm and many more.

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

Solution:

Given perimeter of hexagon = 60cm

No. of sides in hexagon = 6

Now, length of each side of hexagon = $\dfrac{60}{6}$

$$= 10\text{cm}$$

37. In an exhibition hall, there are 24 display boards each of length 1m 50cm and breadth 1m. There is a 100 m 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:

Given, Total number of display boards = 24
Also, Length of strip = 100 m
Length of each display board = 1.5 m
And Breadth of one display board = 1 m
This implies, perimeter of one display board = 2(l + b)
$$= 2 (1.5 + 1)$$
$$= 5 \text{ m}$$
Now, number of boards which will be framed = $\dfrac{100}{5}$
$$= 20$$
Thus, number of boards remained unframed = 24 – 20
$$= 4$$
So, Length of strip that will be required for remaining boards
= 4 × Perimeter of one board
= 4 × 5
= 20 m

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

Solution:

As given, Length of display board = 1 m 50 cm
$$= 1.5 \text{ m}$$
Breadth of display board = 1 m
So, Area of 24 display boards = 24(l × b)
$$= 24(1.5 × 1)$$

$$= 24 \times 1.5$$

$$= 36 \text{ sqm}$$

Therefore, 36 sqm of cloth is required to cover all the display boards.

Now, breadth of cloth = 120 cm

$$= 1.2 \text{ m}$$

Thus, Length of cloth $= \dfrac{36}{1.2}$

$$= 30 \text{ m}$$

39. What is the length of outer boundary of the park shown in Fig. 6.16? What will be the total cost of fencing it at the rate of Rs 20 per metre? There is a rectangular flower bed in the center of the park. Find the cost of manuring the flower bed at the rate of Rs 50 per square metre.
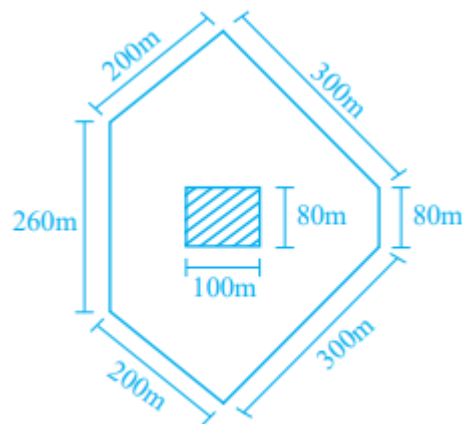

Fig. 6.16

Solution:

The length of outer boundary of the park = (200 + 300 + 80 + 300 + 200 + 260) m

$$= 1340 \text{ m}$$

This implies cost of fencing the park at the rate of Rs. 20 per metre = Rs. (20 × 1340)

$$= \text{Rs } 26800$$

Now, Area of the flower bed = (100 ×80)

$$= 8000 \text{ sqm}$$

Thus, the cost of manuring the flower bed at the rate of Rs. 50 per square metre

= Rs. (50 × 8000)

= Rs. 400000

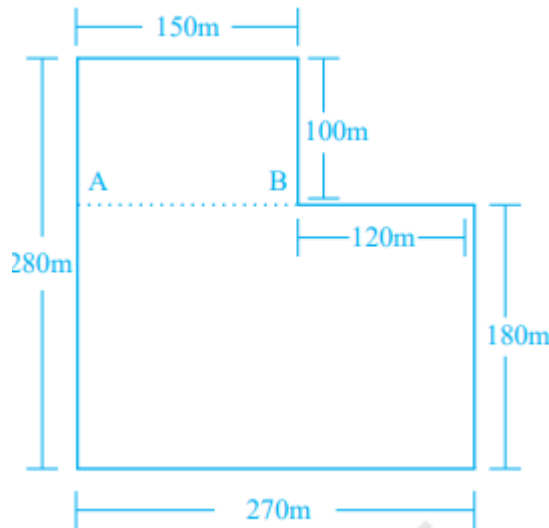**40. Total cost of fencing the park shown in Fig. 6.17 is Rs 55000. Find the cost of fencing per metre.**

Fig. 6.17

Solution:

Given, perimeter of given figure = 150 + 100 + 120 +180 + 270 + 280

$$= 1100m$$

Also given total cost of fencing = Rs 55000

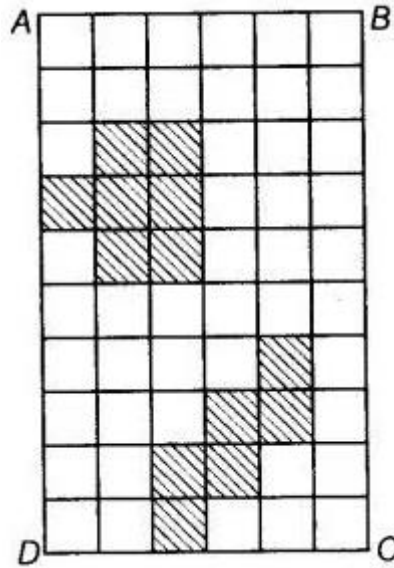So, cost of fencing per metre = $\dfrac{55000}{1100}$

$$= Rs\ 50$$

41. In Fig. 6.18 each square is of unit length

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

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

(c) Divide this rectangle into ten parts of equal area by shading squares. (Two parts of equal area are shown here)

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

Solution:

(a) Perimeter of rectangle ABCD = $2(10 + 6)$

$$= 120 \text{ units}$$

(b) Area of rectangle ABCD = 10×6

$$= 60 \text{ square units}$$

(c) When rectangle is divided into 10 equal parts area of each part is 6 square units.

(d) Perimeter of each part = $1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1$

$$= 12 \text{ units}$$

And perimeter of all parts is equal.

42. Rectangular wall MNOP of a kitchen is covered with square tiles of 15cm length (Fig. 6.19). Find the area of the wall.
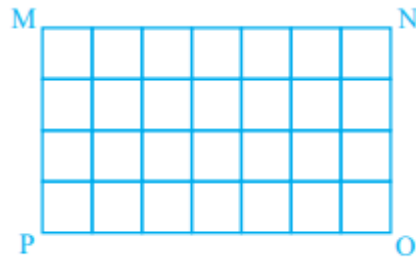
Fig. 6.19

Solution:

Given, length of square tile = 15cm

No. of tiles in given figure = 28

Now area of each tile = 15×15

$= 225$sqcm

This implies area of 28 tiles = 28×225

$= 6300$ square cm

Thus, area of wall = 6300 square cm

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

Solution:

Given, Length of a rectangular field = 6 times its breadth

This implies breadth of the field = $\dfrac{Length}{6}$

Length of field = 120cm

Thus, breadth = $\dfrac{120}{6}$

$= 20$ cm

Now perimeter of field = $2(l + b)$

$= 2(120 + 20)$

$= 280$cm

44. Anmol has a chart paper of measure 90cm × 40cm, whereas Abhishek has one which measures 50cm × 70cm. Which will cover more area on the table and by how much?

Solution:

Area of chart paper of Anmol $= 90 \times 40$

$$= 3600 \text{ square cm}$$

Also, area of chart paper of Abhishek $= 50 \times 70$

$$= 3500 \text{ square cm}$$

Thus, chart paper of Anmol cover more area on table and by $= 3600 - 3500$

$$= 100 \text{ square cm}$$

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:

Given, length and width of rectangular path = 60m and 3m

Also, side of square tile = 25cm

Thus, no. of tiles in a row $= \dfrac{3}{0.25}$

$$= 12$$

Now, no. of rows $= \dfrac{60}{0.25}$

$$= 240$$

Hence, total no. of tiles $= 12 \times 240$

$$= 2880$$

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

Solution:

Here, area of each square slab = 90×90

$$= 8100 \text{ square cm}$$

Also area of floor = 81 square m

$$= 81 \times 10000$$

$$= 810000 \text{ square cm}$$

No. of square slabs required $= \dfrac{810000}{8100}$

$$= 100$$

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:

Given, Perimeter of rectangular field = perimeter of squaree field
This implies, $2(8m+2m) = 4 \times \text{side}$

Side of square field $= \dfrac{20}{4}$

$$= 5 \text{ m}$$

Now area of rectangular field $= 8 \times 2$

$$= 16 \text{ m}^2$$

Area of square field $= 5 \times 5$

$$= 25 \text{ m}^2$$

So, area of square field is greater than area of rectangular field.

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

Solution:

Given perimeter of park = 800 m

Thus, if side of square is a, then

$4 \times a = 800$

a = 200 m

Now area of park = 200×200

$= 40000 \text{ m}^2$

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

Solution:

Given, side of square = 5cm

Area of square = 5×5

$= 25 \text{ cm}^2$

Now side of square becomes = 5×2

$= 10\text{cm}$

Now area of square = 10×10

$= 100 \text{ cm}^2$

Area increases by = $100 - 25$

$= 75 \text{ cm}^2$

50. Amita wants to make rectangular cards measuring 8cm × 5cm. She has a square chart paper of side 60cm. How many complete cards can she make from this chart? What area of the chart paper will be left?

Solution:

Given, area of the square chart = 60×60

$= 3600 \text{ cm}^2$

Now, area of card = 8×5

$= 40 \text{ cm}^2$

This implies, No. of cards that can be made = $\dfrac{3600}{40}$

$= 90 \text{ cards}$

51. A magazine charges Rs 300 per 10sqcm area for advertising. A company decided to order a half page advertisment. If each page of the magazine is 15cm × 24cm, what amount will the company has to pay for it?

Solution:

Area of one page of magazine = (15×24) cm^2

$$= 360 \text{ cm}^2$$

Thus, area of the half page of magazine = $\dfrac{360}{2}$ cm^2

$$= 180 \text{ cm}^2$$

Also give, cost of advertising for 10 sqcm = Rs. 300

This implies cost of advertising for 180 sqcm = $\dfrac{300}{10} \times 150$

$$= \text{Rs. } 5400$$

52. The perimeter of a square garden is 48m. A small flower bed covers 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 flower bed? Find the ratio of the area covered by the flower bed and the remaining area.

Solution:

Given, perimeter of the square garden = 48 m

This implies, 4 x side = 48 m

$$\text{Side} = \dfrac{48}{4} \text{ m}$$

$$= 12 \text{ m}$$

Now, area of the square garden = side × side

$$= 12 \text{ m} \times 12 \text{ m}$$

$$= 144 \text{ m}^2$$

Also given, Area of the small flower bed = 18 m^2

So, we have the area of the garden that is not covered by the flower bed

$$= 144 - 18$$

$= 126 \text{ m}^2.$

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

= Area of the flower bed/ Area of the square garden

$= \dfrac{15}{144} = \dfrac{1}{8}$

In addition, ratio of the area covered by the flower bed and the remaining area

$= \dfrac{18}{126}$

$= \dfrac{1}{7}$

$= 1:7$

53. Perimeter of a square and a rectangle is same. If a side of the square is 15cm and one side of the rectangle is 18cm, find the area of the rectangle.

Solution:

Given, Perimeter of a square = Perimeter of a rectangle

Also side of square = 15cm

side of rectangle = 18cm

Thus, $4 \times 15 = 2(18 + b)$

$\qquad b = 30 - 18$

$\qquad = 12 \text{ cm}$

Now area of rectangle $= 18 \times 12$

$\qquad\qquad = 216 \text{ cm}^2$

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:

Let number of small pieces in which the wire is cut down be = x

Also given side of each square shaped piece = 2 cm

So, Area of each piece $= 2 \times 2$

$$= 4 \text{ cm}^2$$

Given total area of the small squares $= 28$ cm²

Thus, $4x = 28$

$x = 7$

So we have number of pieces $= 7$

It will give perimeter of each piece with side 2 cm $= 4 \times 2$

$$= 8 \text{ cm}$$

Therefore, Total length of the wire $= 7 \times 8$

$$= 56 \text{ cm}$$

55. Divide the park shown in Fig. 6.17 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:

Total area of the park $= 15000 + (270 \times 180)$

$$= 15000 + 48600$$

$$= 63600 \text{ m}^2$$

Now one packet of fertilizer used for area $= 300 \text{ m}^2$

Thus, total packets of fertilizer required $= \dfrac{63600}{300}$

$$= 121$$

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

Solution:

Given, area of a rectangular field $= 1600 \text{ m}^2$

And length of field $= 80$m

Now area of rectangular field is $= 1 \times b$

This implies, $80 \times b = 1600$

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

$$= 20 \text{ m}$$

Now, perimeter of rectangular field $= 2(l + b)$

$$= 2(80 + 20)$$

$$= 200 \text{ m}$$

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

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

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

Solution:

Given, area of one square on a chess board $= 4$ sq cm

Now there are 64 squares on a chess board.

This implies area of chess board $= 64 \times 4 \text{ cm}^2$

$$= 256 \text{ cm}^2$$

(a) At the beginning of game when all the chess men are put on the board, 32 squares left unoccupied

Thus, area of the squares left unoccupied $= 32 \times$ area of one square

$$= 32 \times 4 \text{ cm}^2$$

$$= 128 \text{ cm}^2$$

(b) Area occupied by chess men $= 32 \times 4$

$$= 128 \text{ cm}^2$$

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:

(a)

Perimeter of the rectangle = 36 cm
2(length + breadth) = 36 cm

Length + breadth $= \frac{36}{2}cm = 18cm$

All the possible dimensions (in natural numbers) of a rectangle with a perimeter 36cm are:

17×1cm

16× 2cm

15×3cm

14×4cm

13×5cm

12×6cm

11×7cm

10×8cm

9×9cm respectively.

Their corresponding areas are = 17 cm², 32 cm², 45 cm², 56 cm², 65 cm², 72 cm², 77 cm², 80cm² and 81cm².

(b)

The area of the rectangle = 36 sq cm
 length × breadth = 36 sq cm
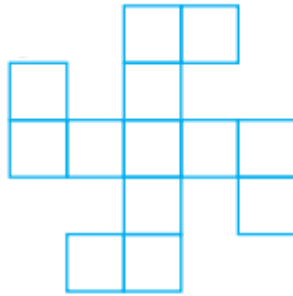
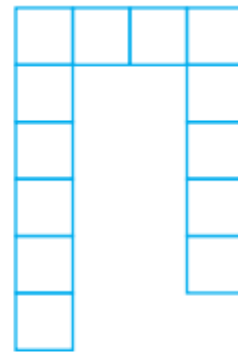| Dimensions	Perimeter
1 cm × 36 cm	2(1 + 36) cm = 74 cm
2 cm × 18 cm	2(2 + 18) cm = 40 cm
3 cm × 12 cm	2(3 + 12) cm = 30 cm
4 cm × 9 cm	2(4 + 9) cm = 26 cm
6 cm × 6 cm	2(6 + 6) cm = 24 cm

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

(i) (ii) (iii)

Fig. 6.20

Solution:

(i) Area of the given figure $= 11 \times 1 \text{ cm}^2$

$$= 11 \text{ cm}^2$$

Perimeter of given figure $= 18 \times 1$

$$= 18 \text{ cm}$$

(ii) Area of the given figure $= 13 \times 1 \text{ cm}^2$

$$= 13 \text{ cm}^2$$

Perimeter of given figure $= 28 \times 1$

$$= 28 \text{ cm}$$

(iii) Area of the given figure $= 13 \times 1 \text{ cm}^2$

$$= 13 \text{ cm}^2$$

Perimeter of given figure $= 28 \times 1$

$$= 28 \text{ cm}$$

60. What is the area of each small square in the Fig. 6.21 if the area of entire figure is 96sqcm. Find the perimeter of the figure.
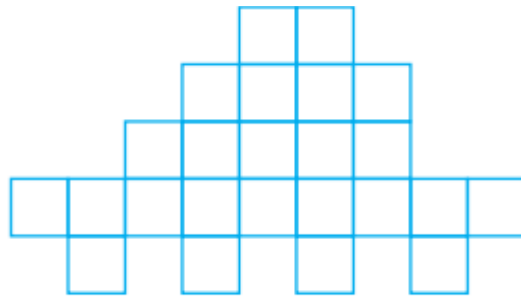
Fig. 6.21

Solution:

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

Area of total figure = 96 cm^2

So area of each small square = $\dfrac{96}{24}$

$$= 4 \text{ cm}^2$$

Now side of each small square = 2 cm

Perimeter of the figure = 34×2

$$= 68 \text{cm}$$