

EXERCISE

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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?

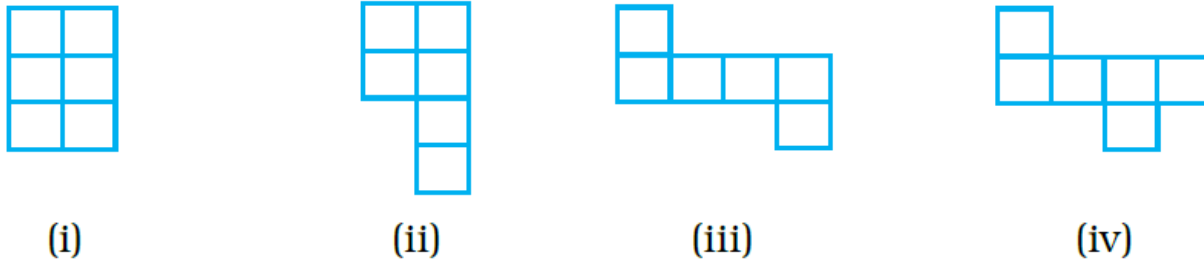


Fig. 6.4

Solution:-

Figure (i) has the smallest perimeter.

Perimeter of a closed figure is the distance covered in one round along the boundary of the figure.

We know that, perimeter of figure = numbers of sides \times length of each sides

Consider the given figures,

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

$$\begin{aligned}\text{So, perimeter} &= 10 \times 1 \\ &= 10 \text{ cm}\end{aligned}$$

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

$$\begin{aligned}\text{So, perimeter} &= 12 \times 1 \\ &= 12 \text{ cm}\end{aligned}$$

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

$$\begin{aligned}\text{So, perimeter} &= 14 \times 1 \\ &= 14 \text{ cm}\end{aligned}$$

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

$$\begin{aligned}\text{So, perimeter} &= 14 \times 1 \\ &= 14 \text{ cm}\end{aligned}$$

By comparing all the perimeters of given figures, figure (i) has smallest perimeter.

2. A square shaped park ABCD of side 100m has two equal rectangular flower beds each of size 10m \times 5m (Fig. 6.5). Length of the boundary of the remaining park is

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

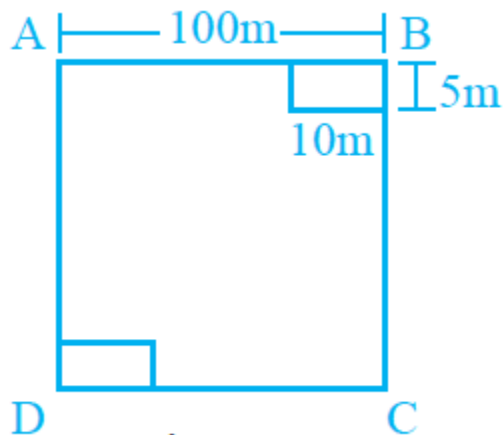


Fig. 6.5

Solution:-

(B) 400m

We know that, Length of the boundary = Perimeter of boundary

Given, two rectangular flower beds each of size 10m × 5m

So, perimeter of remaining park = $90 + 5 + 10 + 95 + 90 + 5 + 10 + 95$
= 400 m

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:-

(A) 2 times

As we know that, perimeter of square = side × 4
= 10×4
= 40 cm

Given, side of square = 10 cm

The side of the square is doubled = $10 + 10$
= 20 cm

Therefore, the new perimeter becomes 2 times the side of the square is doubled.

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?

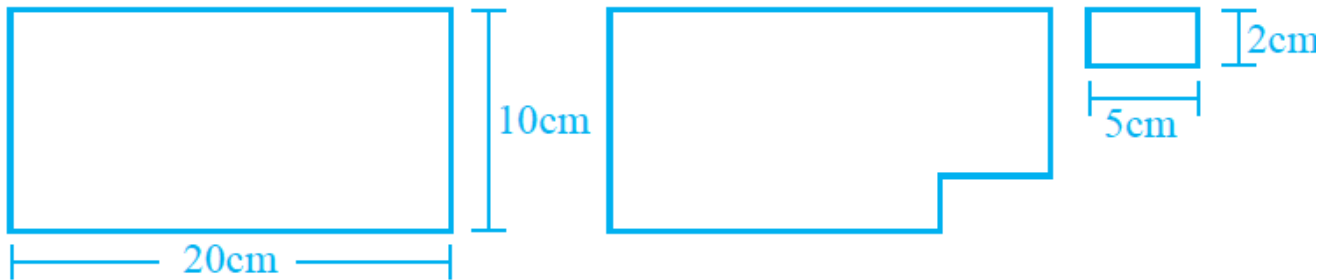


Fig. 6.6

- (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:-

(A) Perimeter remains same but area changes.

$$\begin{aligned}\text{We know that, area of big rectangle} &= \text{length} \times \text{breadth} \\ &= 10 \times 20 \\ &= 200 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{Area of small rectangle} &= 5 \times 2 \\ &= 10 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{Perimeter of rectangle} &= 2(\text{length} + \text{breadth}) \\ &= 2(20 + 10) \\ &= 2 \times 30 \\ &= 60 \text{ cm}\end{aligned}$$

$$\begin{aligned}\text{Then, perimeter of new figure} &= 20 + 8 + 5 + 2 + 15 + 10 \\ &= 60\end{aligned}$$

$$\begin{aligned}\text{Area of new figure} &= \text{Area of big rectangle} - \text{Area of new figure} \\ &= 200 - 10 \\ &= 190 \text{ cm}^2\end{aligned}$$

By comparing all the results, Perimeter remains same but area changes.

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:-

(D) 50cm

From the question it is given that, perimeter of each hexagon = 30 cm

We know that, hexagon has 6 sides.

So, length of each side of hexagon = $30/6$
= 5 cm

Now, consider two hexagons are joined together.

Then, perimeter of new figure = number of sides \times length of each side
= 10×5
= 50 cm

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



(i)



(ii)



(iii)



(iv)

(A) (i)

(B) (ii)

(C) (iii)





(D) (iv)

Solution:-

(B) (ii)

A closed figure in which all sides and angles are equal is called a regular polygon.

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:-

Given, each side measures 2cm.

Figure (A) has 14 sides.

$$\begin{aligned}
 \text{Perimeter of figure} &= \text{number of sides} \times \text{length of each side} \\
 &= 14 \times 2 \\
 &= 28 \text{ cm}
 \end{aligned}$$

Figure (B) has 8 sides.





$$\begin{aligned}
 \text{Perimeter of figure} &= \text{number of side} \times \text{length of each side} \\
 &= 8 \times 2 \\
 &= 16 \text{ cm}
 \end{aligned}$$

Figure (C) has 10 sides.




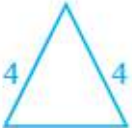
$$\begin{aligned}
 \text{Perimeter of figure} &= \text{number of sides} \times \text{length of each side} \\
 &= 10 \times 2 \\
 &= 20 \text{ cm}
 \end{aligned}$$

Figure (D) has 12 sides.

$$\begin{aligned}
 \text{Perimeter of figure} &= \text{number of sides} \times \text{length of each side} \\
 &= 12 \times 2 \\
 &= 24 \text{ cm}
 \end{aligned}$$

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

8. Match the following

Shapes	Perimeter
(A)  rectangle	(i) 10
(B)  square	(ii) 18
(C)  equilateral triangle	(iii) 20
(D)  isosceles triangle	(iv) 25

Solution:-

(A) Perimeter of a rectangle = $2 \times (\text{length} + \text{breadth})$

$$= 2 \times (6 + 4)$$

$$= 2 \times 10$$

$$= 20$$

(B) Perimeter of a square = $4 \times \text{length of its side}$

$$= 4 \times 5$$

$$= 20$$

(C) Perimeter of an equilateral triangle = $3 \times \text{length of a side}$


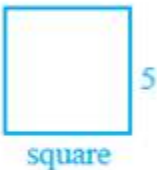


$$= 3 \times 6$$

$$= 18$$

(D) perimeter of isosceles triangle = sum of length of all sides

$$= 4 + 4 + 2$$

$$= 10$$

Shapes	Perimeter
<p>(A)  rectangle</p>	(iii) 20
<p>(B)  square</p>	(iii) 20
<p>(C)  equilateral triangle</p>	(ii) 18
<p>(D)  isosceles triangle</p>	(i) 10

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

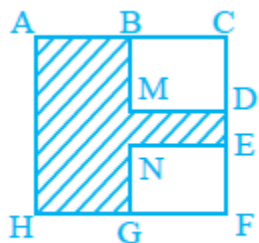


Fig. 6.9

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

Solution:-

We know that perimeter of a figure = sum of length of all sides

$$= AB + \underline{BM + MD + DE + EN + NG + GH} + HA$$

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

Solution:-

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

Area of rectangle = length \times breadth

$$= 5 \text{ cm} \times 3 \text{ cm}$$

$$= 15 \text{ cm}$$

12. A rectangle and a square have the same perimeter (Fig. 6.10).

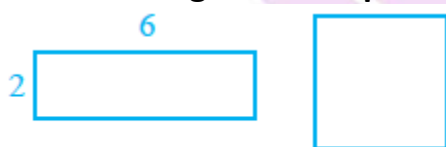


Fig. 6.10

(a) The area of the rectangle is _____.

Solution:-

The area of the rectangle is 12 sq. units.

From figure, length of rectangle is 6 and breadth is 2.

Then, area of rectangle = length \times breadth

$$= 6 \times 2$$

$$= 12 \text{ sq. units}$$

Perimeter of rectangle = 2 \times (length + breadth)

$$= 2 \times (6 + 2)$$

$$= 2 \times 8$$
$$= 16 \text{ units}$$

(b) The area of the square is _____.

Solution:-

The area of the square is 16 sq. Units.

From the question it is given that, rectangle and a square have the same perimeter.

So, length of each side of a square = $16/4$

$$= 4 \text{ units.}$$

Area of square = side \times side

$$= 4 \times 4$$

$$= 16 \text{ sq. Units}$$

13. (a) 1m = _____ cm.

Solution:-

$$1\text{m} = \underline{100} \text{ cm.}$$

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

Solution:-

$$1\text{sqcm} = \underline{1} \text{ cm} \times 1\text{cm.}$$

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

Solution:-

$$1\text{sqm} = 1\text{m} \times \underline{1} \text{ m}$$

$$= 100\text{cm} \times \underline{100} \text{ cm.}$$

(d) 1sqm = _____ sqcm.

Solution:-

$$1\text{sqm} = \underline{10000} \text{ sqcm.}$$

We know that, 1 m = 100 cm

$$\text{Then, } 1 \text{ sqm} = 100 \times 100$$

$$= 10000\text{sqcm}$$

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:-

True.

We know that, area of rectangle = length \times breadth

As per the condition given in the question, length of a rectangle is halved = $l/2$

Breadth is doubled = $2b$

Then, new area = $l/2 \times 2b$
 $= l \times b.$

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

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

Solution:-

False

We know that, area of square = side \times side

As per the condition given in the question, side of the square is doubled = $2 \times$ side

Then, new area = $2\text{side} \times 2\text{side}$
 $= 4 \text{ side}^2$

Therefore, if the side of the square is doubled then the area of the square obtained is 4 times the old area.

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

Solution:-

False.

Perimeter of regular octagon = number of sides \times length of each sides
 $= 8 \times 6$
 $= 48 \text{ cm}$

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

Solution:-

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:-

False.

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

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

Solution:-

False.

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

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

Solution:-

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.

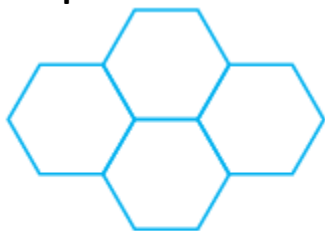


Fig. 6.11

Solution:-

From the question it is given that, the perimeter of the design is 28cm.

Given design has 14 sides, so length of each side = $28/14$
 $= 2 \text{ cm}$

In the given figure, 4 regular hexagons are joined.

Therefore, the length of each side of the hexagon = 2 cm

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

Solution:-

We know that, isosceles triangle contains two equal sides.

From the question it is given that, one of the two equal sides is 18cm.

And Perimeter of an isosceles triangle is 50cm

We know that, perimeter of isosceles triangle = sum of all sides

Let us assume the third side be x.

Then,

$$50 = 18 + 18 + x$$

$$50 = 36 + x$$

$$x = 50 - 36$$

$$X = 14 \text{ cm}$$

Therefore, the length of third side of an isosceles triangle is 14 cm.

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

Solution:-

From the question it is given that,

Perimeter of rectangle = 40 cm

Length of a rectangle is three times its breadth = $3b$

We know that, perimeter of rectangle = $2 \times (\text{length} + \text{breadth})$

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

$$40 = 2 \times 4b$$

$$40 = 8b$$

$$40/8 = b$$

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

Therefore, width of rectangle = 5 cm

Length of rectangle = $3b$

$$= 3 \times 5$$

$$= 15 \text{ cm}$$

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.

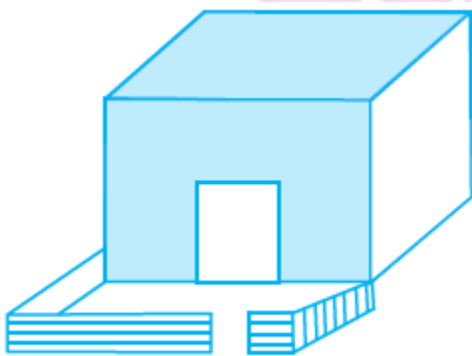


Fig. 6.12

Solution:-

From the question it is given that,

Length of rectangular lawn = 10m

Width of rectangular lawn = 4m

Then,

Perimeter of fencing = length of fencing

Perimeter of fencing = two smaller sides + one longer side – gap in the longer side

$$= 4 + 4 + 10 - 1$$

$$= 18 - 1$$

$$= 17 \text{ m}$$

Therefore, length of fencing is 17 m.

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

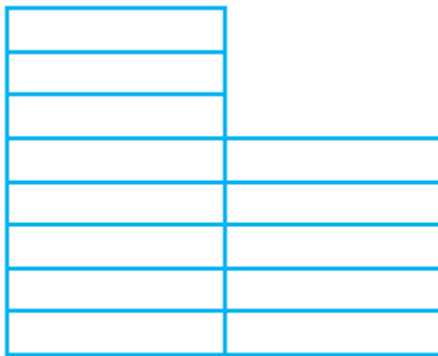


Fig. 6.13

Solution:-

From the question it is given that, a region measured by taking rectangle is as one unit.
Given figure contain 13 rectangles.

Therefore, area of the region = 13×1
= 13 sq. Units

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.

Solution:-

From the question it is given that,

Tahir measured the distance around a square field as 200 rods

Length of the rod = 140 cm

So, total distance of square field = 200×140
= 28000 cm

Then, length of one side of square field = $28000/4$
= 7000 cm

We know that, 1 m = 100 cm

Therefore, side of field = $7000/100$
= 70 m

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:-

From the question it is given that,

The length of a rectangular field is twice its breadth = $2b$

Perimeter of rectangular field = $6\text{km}/4$

$$= 1.5 \text{ km}$$

We know that, perimeter of rectangle = $2 \times (\text{length} + \text{breadth})$

$$1.5 = 2 \times (2b + b)$$

$$1.5 = 2 \times 3b$$

$$1.5 = 6b$$

$$b = 1.5/6$$

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

length of rectangle field = $2 \times 0.25 = 0.5\text{km}$

$$= 0.5 \times 1000$$

$$= 500 \text{ m}$$

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.

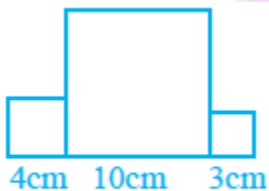
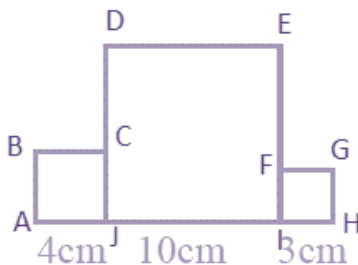


Fig. 6.14

Solution:-



We know that, perimeter of figure = sum of all sides

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

$$\begin{aligned}
 &= 4 + 4 + (10 - 4) + 10 + (10 - 3) + 3 + 3 + 3 + 10 + 4 \\
 &= 4 + 4 + 6 + 10 + 7 + 3 + 3 + 3 + 10 + 4 \\
 &= 54 \text{ cm}
 \end{aligned}$$

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?

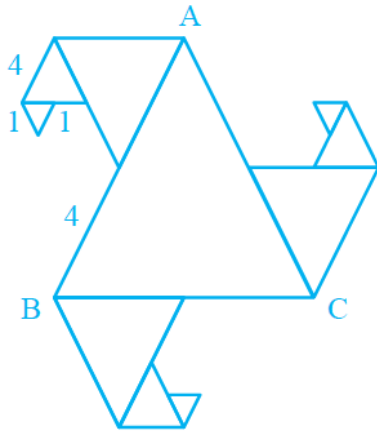
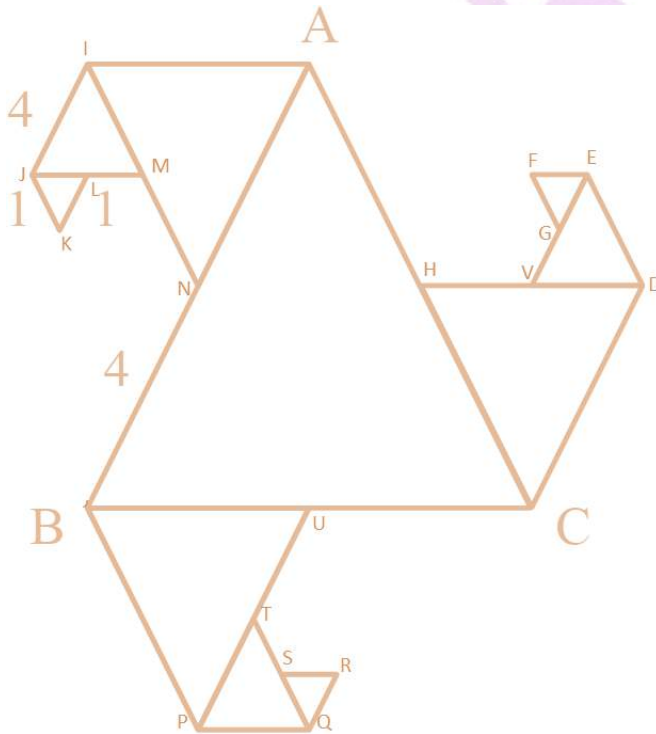


Fig. 6.15

Solution:-

45 units



Perimeter of given figure = sum of length of each side

$$= BN + NM + ML + LK + KJ + JI + IA + AH + HV + VG + GF + FE + ED + DC + UC$$

$$\begin{aligned}&+ UT + TS + SR + RQ + PQ + BP \\&= 4 + 2 + 1 + 1 + 1 + 2 + 4 + 4 + 2 + 1 + 1 + 1 + 2 + 4 + 4 + 2 + 1 + 1 + 1 + 2 + 4 \\&= 45 \text{ units}\end{aligned}$$

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:-

From the question it is given that,

Length of a rectangular field is 250m

Width of rectangular field = 150 m

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

$$= 2 \times (250 + 150)$$

$$= 2 \times 400$$

$$= 800 \text{ m}$$

Given that, Anuradha runs around this field 3 times = 3×800
= 2400 m

We know that, 1km = 1000 m

So, $2400/1000$

= 2.4 km i.e. 2 km 400 m

Number of times Anuradha should run around the field to cover a distance of 4km =

$$4000/800$$

= 5 times

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