

# UNIQUE STUDY POINT

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<b>Class:</b> VI	<b>Subject:</b> Mathematics	<b>Session:</b> 2025-26
<b>Chapter:</b> 06 - Perimeter and Area	<b>Time:</b> 1½ Hours	<b>Max. Marks:</b> 40

## General Instructions:

1. All questions are compulsory.
2. This question paper contains 20 questions divided into five sections A, B, C, D and E.
3. Section A contains 10 MCQs of 1 mark each.
4. Section B contains 4 questions of 2 marks each.
5. Section C contains 3 questions of 3 marks each.
6. Section D contains 1 question of 5 marks.
7. Section E contains 2 Case Study Based questions of 4 marks each.

## SECTION A - Multiple Choice Questions (1 mark each)

1. A rectangular field is 45 m long and 30 m wide. If it is divided into 15 equal square plots, the side of each square plot is:
  - (a) 6 m
  - (b) 9 m
  - (c) 10 m
  - (d) 15 m
2. The ratio of the perimeter of a square to its side is:
  - (a) 1:2
  - (b) 2:1
  - (c) 4:1
  - (d) 1:4
3. The perimeter of a rectangle remains unchanged when its length is increased by 5 cm and breadth is decreased by 5 cm. This is possible when:
  - (a) Original length equals breadth
  - (b) The rectangle becomes a square
  - (c) Always true for any rectangle
  - (d) Never possible
4. If each side of a square is tripled, its area becomes:
  - (a) 3 times
  - (b) 6 times
  - (c) 9 times
  - (d) 12 times
5. A wire of length 52 cm is first bent to form a rectangle with length 15 cm. Then it is bent to form a square.

The difference in their areas is:

- (a) 4 sq cm
- (b) 8 sq cm
- (c) 16 sq cm
- (d) 24 sq cm

6. A rectangular plot  $80\text{ m} \times 60\text{ m}$  has two roads each  $5\text{ m}$  wide running through its middle, one parallel to length and one parallel to breadth. The area covered by roads is:
- (a) 675 sq m
  - (b) 700 sq m
  - (c) 725 sq m
  - (d) 650 sq m
7. The cost of fencing a circular garden is same as fencing a square garden. If the side of square is  $44\text{ m}$  and cost is ₹10 per m, the perimeter of circular garden is:
- (a) 132 m
  - (b) 154 m
  - (c) 176 m
  - (d) 198 m
8. The length and breadth of a rectangle are in ratio 5:3. If perimeter is  $64\text{ cm}$ , its length is:
- (a) 15 cm
  - (b) 20 cm
  - (c) 25 cm
  - (d) 30 cm
9. A rectangular carpet has area  $120\text{ sq m}$  and perimeter  $46\text{ m}$ . Its length is:
- (a) 8 m
  - (b) 12 m
  - (c) 15 m
  - (d) 20 m
10. Two squares have sides in ratio 2:3. The ratio of their areas is:
- (a) 2:3
  - (b) 4:9
  - (c) 9:4
  - (d) 3:2

### SECTION B - Short Answer Questions (2 marks each)

11. The perimeter of a rectangular field is  $82\text{ m}$  and its area is  $400\text{ sq m}$ . Find the breadth if length is  $25\text{ m}$ . Verify your answer.
12. Find the side of a square whose perimeter equals the perimeter of a rectangle with dimensions  $35\text{ m}$  by  $25\text{ m}$ . Also compare their areas.
13. A wire when bent in the form of an equilateral triangle encloses an area of  $121\sqrt{3}\text{ sq cm}$ . If the same wire is bent to form a square, what will be the area enclosed?
14. The length of a rectangle is twice its breadth. If the perimeter is  $72\text{ cm}$ , find its dimensions and area.

### SECTION C - Short Answer Questions (3 marks each)

**15.** A rectangular lawn 80 m by 60 m has two roads each 10 m wide running through its middle, one parallel to length and other to breadth. Find the cost of gravelling the roads at ₹50 per sq m.

**16.** The perimeter of a square and a rectangle are equal. The rectangle measures 26 cm by 18 cm. Calculate how much the area of square exceeds the area of rectangle.

**17.** A room is 13 m long and 9 m wide. A square carpet of side 8 m is laid on the floor. Find what fraction of the floor is not carpeted.

#### SECTION D - Long Answer Question (5 marks)

**18.** A rectangular park 100 m long and 80 m wide has two paths each 5 m wide running through its middle crossing each other at right angles.

- Draw a rough sketch showing the paths.
- Find the area of the path running parallel to length.
- Find the area of the path running parallel to breadth.
- Find the total area of both paths. (Be careful not to count the intersection twice!)
- If the rest of the park is covered with grass at ₹40 per sq m, find the total cost.

#### SECTION E - Case Study Based Questions (4 marks each)

##### 19. Cricket Stadium

A rectangular cricket stadium is 150 m long and 120 m wide. It has a pavilion on one side measuring 30 m × 20 m and a practice pitch area measuring 40 m × 30 m on the opposite side.

- Find the total area of the stadium. (1 mark)
- Find the combined area of pavilion and practice pitch. (1 mark)
- Find the area available for spectators and players (excluding pavilion and practice area). (1 mark)
- If a boundary rope is placed all around the stadium, what length of rope is needed? (1 mark)

##### 20. Tile Pattern

A rectangular floor 12 m long and 8 m wide is to be covered with square tiles. Each tile has a side of 40 cm.

- Convert the floor dimensions to cm and find the floor area in sq cm. (1 mark)
- Find the area of one tile. (1 mark)
- How many tiles are needed to cover the entire floor? (1 mark)
- If each tile costs ₹25, find the total cost of tiles. (1 mark)

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SECTION A - Answers to MCQs

1. (b) 9 m

Total area =  $45 \times 30 = 1350$  sq m  
 Area of each plot =  $1350 \div 15 = 90$  sq m  
 Side =  $\sqrt{90} \approx 9$  m (considering perfect square division)

2. (c) 4:1

Perimeter =  $4 \times$  side  
 Ratio =  $4 \times$  side : side = 4:1

3. (c) Always true for any rectangle

Perimeter =  $2(l + b) = 2(l+5 + b-5) = 2(l + b)$   
 The changes cancel out in perimeter calculation.

4. (c) 9 times

Original area =  $a^2$   
 New area =  $(3a)^2 = 9a^2 = 9$  times

5. (c) 16 sq cm

Rectangle: breadth =  $26 - 15 = 11$  cm, Area =  $15 \times 11 = 165$  sq cm  
 Square: side =  $52 \div 4 = 13$  cm, Area = 169 sq cm  
 Difference =  $169 - 165 = 4$  sq cm

6. (a) 675 sq m

Road parallel to length =  $80 \times 5 = 400$  sq m  
 Road parallel to breadth =  $60 \times 5 = 300$  sq m  
 Intersection (counted twice) =  $5 \times 5 = 25$  sq m  
 Total =  $400 + 300 - 25 = 675$  sq m

7. (c) 176 m

Perimeter of square =  $4 \times 44 = 176$  m  
 Since costs are same, perimeters are equal = 176 m

8. (b) 20 cm

Let length =  $5x$ , breadth =  $3x$   
 $2(5x + 3x) = 64$   
 $16x = 64, x = 4$   
 Length =  $5 \times 4 = 20$  cm

9. (c) 15 m

$2(l + b) = 46$ , so  $l + b = 23$   
 $l \times b = 120$   
 Solving:  $l = 15$  m,  $b = 8$  m

10. (b) 4:9

If sides are  $2x$  and  $3x$

Areas are  $(2x)^2 : (3x)^2 = 4x^2 : 9x^2 = 4:9$

## SECTION B - Answers to Short Answer Questions

11.

**Given:** Perimeter = 82 m, Area = 400 sq m, Length = 25 m

**Step 1:**  $2(25 + b) = 82$

$25 + b = 41$

$b = 16$  m

**Verification:** Area =  $25 \times 16 = 400$  sq m ✓

**Answer:** Breadth = 16 m

12.

**Given:** Rectangle = 35 m  $\times$  25 m

**Step 1:** Perimeter =  $2 \times (35 + 25) = 120$  m

**Step 2:** Side of square =  $120 \div 4 = 30$  m

**Step 3:** Area of square = 900 sq m

**Step 4:** Area of rectangle = 875 sq m

**Answer:** Side = 30 m, Square area is greater by 25 sq m

13.

**Given:** Area of equilateral triangle =  $121\sqrt{3}$  sq cm

**Step 1:** Using formula:  $(\sqrt{3}/4)a^2 = 121\sqrt{3}$

$a^2 = 484$ ,  $a = 22$  cm

**Step 2:** Perimeter =  $3 \times 22 = 66$  cm

**Step 3:** Side of square =  $66 \div 4 = 16.5$  cm

**Step 4:** Area =  $16.5 \times 16.5 = 272.25$  sq cm

**Answer:** Area of square = 272.25 sq cm

14.

**Given:** Length = 2  $\times$  breadth, Perimeter = 72 cm

**Step 1:** Let breadth = x, then length = 2x

**Step 2:**  $2(2x + x) = 72$

$6x = 72$ ,  $x = 12$  cm

**Step 3:** Breadth = 12 cm, Length = 24 cm

**Step 4:** Area =  $24 \times 12 = 288$  sq cm

**Answer:** 24 cm  $\times$  12 cm, Area = 288 sq cm

## SECTION C - Answers to Short Answer Questions

15.

**Given:** Lawn = 80 m  $\times$  60 m, Road width = 10 m, Rate = ₹50/sq m

**Step 1:** Road parallel to length =  $80 \times 10 = 800$  sq m

**Step 2:** Road parallel to breadth =  $60 \times 10 = 600$  sq m

**Step 3:** Intersection =  $10 \times 10 = 100$  sq m

**Step 4:** Total road area =  $800 + 600 - 100 = 1300$  sq m

**Step 5:** Cost =  $1300 \times 50 = ₹65,000$

**Answer:** Cost = ₹65,000

16.

**Given:** Rectangle = 26 cm  $\times$  18 cm, Equal perimeters

**Step 1:** Perimeter =  $2 \times (26 + 18) = 88$  cm

**Step 2:** Side of square =  $88 \div 4 = 22$  cm

**Step 3:** Area of square =  $22 \times 22 = 484$  sq cm

**Step 4:** Area of rectangle =  $26 \times 18 = 468$  sq cm

**Step 5:** Difference =  $484 - 468 = 16$  sq cm

**Answer:** Square exceeds by 16 sq cm

17.

**Given:** Room =  $13 \text{ m} \times 9 \text{ m}$ , Carpet =  $8 \text{ m} \times 8 \text{ m}$

**Step 1:** Area of room =  $13 \times 9 = 117$  sq m

**Step 2:** Area of carpet =  $8 \times 8 = 64$  sq m

**Step 3:** Uncarpeted area =  $117 - 64 = 53$  sq m

**Step 4:** Fraction =  $53/117$

**Answer:**  $53/117$  of the floor is not carpeted

## SECTION D - Answer to Long Answer Question

18.

**Given:** Park =  $100 \text{ m} \times 80 \text{ m}$ , Path width = 5 m (crossing)

**(a) Sketch:** [Two perpendicular paths crossing in the middle]

**(b) Path parallel to length:**

Area =  $100 \times 5 = 500$  sq m

**(c) Path parallel to breadth:**

Area =  $80 \times 5 = 400$  sq m

**(d) Total area of both paths:**

Intersection =  $5 \times 5 = 25$  sq m

Total =  $500 + 400 - 25 = 875$  sq m

**(e) Cost of grass:**

Total park area =  $100 \times 80 = 8000$  sq m

Grass area =  $8000 - 875 = 7125$  sq m

Cost =  $7125 \times 40 = ₹2,85,000$

**Answers:** (b) 500 sq m, (c) 400 sq m, (d) 875 sq m, (e) ₹2,85,000

## SECTION E - Answers to Case Study Based Questions

19.

**(a) Total area of stadium:**

Area =  $150 \times 120 = 18,000$  sq m

**(b) Combined area of pavilion and practice pitch:**

Pavilion =  $30 \times 20 = 600$  sq m

Practice =  $40 \times 30 = 1200$  sq m

Combined =  $600 + 1200 = 1800$  sq m

**(c) Area for spectators and players:**

Available =  $18,000 - 1800 = 16,200$  sq m

**(d) Length of boundary rope:**

$$\text{Perimeter} = 2 \times (150 + 120) = 540 \text{ m}$$

**Answers:** (a) 18,000 sq m, (b) 1800 sq m, (c) 16,200 sq m, (d) 540 m

**20.**

**(a) Floor dimensions in cm and area:**

$$\text{Length} = 1200 \text{ cm, Breadth} = 800 \text{ cm}$$

$$\text{Area} = 1200 \times 800 = 9,60,000 \text{ sq cm}$$

**(b) Area of one tile:**

$$\text{Area} = 40 \times 40 = 1600 \text{ sq cm}$$

**(c) Number of tiles needed:**

$$\text{Tiles} = 9,60,000 \div 1600 = 600 \text{ tiles}$$

**(d) Total cost:**

$$\text{Cost} = 600 \times 25 = ₹15,000$$

**Answers:** (a) 9,60,000 sq cm, (b) 1600 sq cm, (c) 600 tiles, (d) ₹15,000

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