Mensuration

Formulas for Perimeter and Area

1. Square

- **Perimeter**: $P = 4 \times \text{side}$
- **Area**: $A = \text{side}^2$

2. Rectangle

- **Perimeter**: $P = 2 \times (\text{length} + \text{breadth})$
- **Area**: $A = \text{length} \times \text{breadth}$

3. Triangle

- **Perimeter**: $P = \text{sum of all three sides}$
- **Area**: $A = \frac{1}{2} \times \text{base} \times \text{height}$

4. Equilateral Triangle

- **Perimeter**: $P = 3 \times \text{side}$
- **Area**: $A = \frac{\sqrt{3}}{4} \times \text{side}^2$

5. Polygon (Regular with (n) sides)

- **Perimeter**: $P = n \times \text{side length}$
- **Area**: $A = \frac{1}{4} \times n \times \text{side length}^2 \times \cot\left(\frac{\pi}{n}\right)$

6. Hexagon (Regular)

- **Perimeter**: $P = 6 \times \text{side}$
- **Area**: $A = \frac{3\sqrt{3}}{2} \times \text{side}^2$

Reasoning Questions

1. A square has a side of $12 , \text{cm}$. Find its perimeter and area.
2. A rectangle has a length of $10 , \text{m}$ and a breadth of $6 , \text{m}$. What is its perimeter and area?
3. The base of a triangle is $8 , \text{cm}$, and its height is $5 , \text{cm}$. What is its area?
4. An equilateral triangle has a side length of $9 , \text{cm}$. Calculate its perimeter and area.
5. A regular hexagon has a side length of $7 , \text{m}$. Find its perimeter and area.
6. The perimeter of a square is $64 , \text{cm}$. Find the side and the area of the square.
7. A rectangle has an area of $48 , \text{m}^2$ and a breadth of $4 , \text{m}$. Find its length and perimeter.
8. A triangle has sides of $10 , \text{cm}$, $14 , \text{cm}$, and $16 , \text{cm}$. Find its perimeter.
9. A field is in the shape of an equilateral triangle with a side of $15 , \text{m}$. Find its perimeter and area.
10. A polygon has $8 , \text{sides}$, each $4 , \text{cm}$ long. Calculate its perimeter.
11. A square garden has an area of $81 , \text{m}^2$. Find the side length and its perimeter.
12. The length and breadth of a rectangle are $14 , \text{m}$ and $8 , \text{m}$, respectively. Find its perimeter and area.
13. A triangle has a base of $6 , \text{m}$ and a height of $3 , \text{m}$. What is its area?
14. A regular hexagon has a side length of $10 , \text{cm}$. Find its perimeter and area.

15. The perimeter of a rectangle is 40 cm. If its length is 12 cm, find its breadth and area.
16. A triangle has a perimeter of 30 cm. If two sides are 10 cm and 12 cm, find the third side.
17. A regular polygon has 6 sides, each of length 5 m. Calculate its perimeter.
18. A square park has a perimeter of 80 m. Find its side length and area.
19. The side of a regular hexagon is 9 cm. Find its area.
20. A rectangle's length is twice its breadth. If its perimeter is 36 cm, find its length, breadth, and area.

Answers

1. Perimeter: 48 cm, Area: 144 cm^2
2. Perimeter: 32 m, Area: 60 m^2
3. Area: 20 cm^2
4. Perimeter: 27 cm, Area: 35.07 cm^2
5. Perimeter: 42 m, Area: 127.31 m^2
6. Side: 16 cm, Area: 256 cm^2
7. Length: 12 m, Perimeter: 32 m
8. Perimeter: 40 cm
9. Perimeter: 45 m, Area: 97.43 m^2
10. Perimeter: 32 cm
11. Side: 9 m, Perimeter: 36 m
12. Perimeter: 44 m, Area: 112 m^2
13. Area: 9 m^2
14. Perimeter: 60 cm, Area: 259.81 cm^2
15. Breadth: 8 cm, Area: 96 cm^2
16. Third side: 8 cm
17. Perimeter: 30 m
18. Side: 20 m, Area: 400 m^2
19. Area: 210.44 cm^2
20. Length: 12 cm, Breadth: 6 cm, Area: 72 cm^2

Let me know if you need further clarifications!