

Class 5 Geometry Worksheet by Thinking Juggernaut

Area, Volume, Angles & Coordinate Geometry

Name: _____

Date: _____

Total Marks: 24

🎯 Advanced Geometry Concepts for Class 5

Area (2D Shapes):

- **Square:** Area = side × side = side²
- **Rectangle:** Area = length × width
- **Triangle:** Area = $\frac{1}{2} \times \text{base} \times \text{height}$
- Area is measured in square units (cm², m², km²)

Volume (3D Shapes):

- **Cube:** Volume = side × side × side = side³
- **Cuboid:** Volume = length × width × height
- Volume is measured in cubic units (cm³, m³)

Angles:

- **Complementary Angles:** Two angles that add up to 90°
- **Supplementary Angles:** Two angles that add up to 180°
- **Adjacent Angles:** Angles that share a common vertex and side
- **Vertically Opposite Angles:** Equal angles formed when two lines intersect

Coordinate Geometry Basics:

- Points are located using ordered pairs (x, y)
- x-axis = horizontal line, y-axis = vertical line
- Origin = point (0, 0) where axes meet

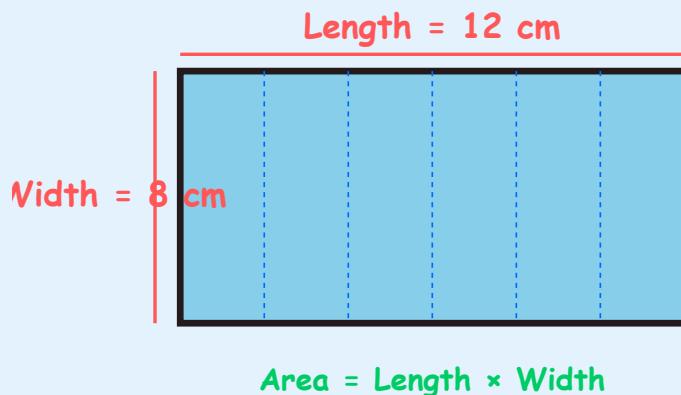
Special Properties:

- Sum of angles in a triangle = 180°
- Sum of angles in a quadrilateral = 360°
- Diagonal of a rectangle divides it into two equal triangles



Sample Problem

Problem: Find the area of a rectangle with length 12 cm and width 8 cm.



Solution:

$$\text{Area} = \text{length} \times \text{width}$$

$$\text{Area} = 12 \text{ cm} \times 8 \text{ cm}$$

$$\text{Area} = 96 \text{ cm}^2$$

Answer: The area is 96 square centimeters!

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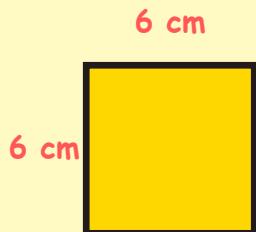
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Part A: Warm-up Questions

★ Easy Level

1. What is the formula for the area of a square?

2. Find the area of a square with side 6 cm.



Area = _____ cm²

3. True or False: The sum of angles in a triangle is 180°.

- True
- False

4. Two angles are complementary. If one angle is 30°, what is the other angle?

Hint: Complementary angles add up to 90°

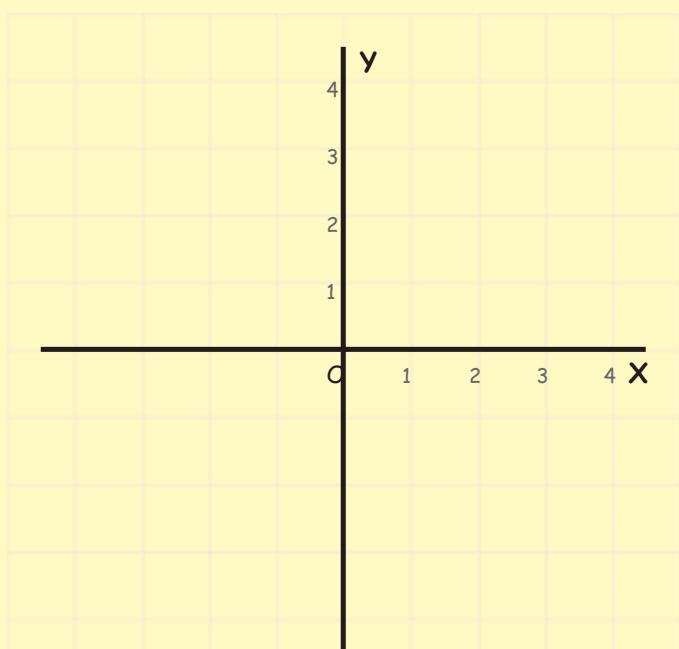
Other angle = _____ °

5. What is the volume of a cube with side 4 cm?

Volume = side³

Volume = _____ cm³

6. Plot the point (3, 4) on the coordinate grid:



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7. Find the perimeter and area of a rectangle: length = 10 m, width = 5 m.

Perimeter = _____ m

Area = _____ m^2

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8. If two supplementary angles are equal, what is the measure of each angle?

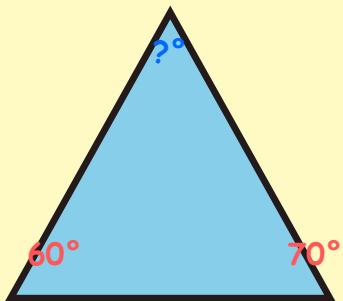
Hint: Supplementary angles add up to 180°

Each angle = _____ $^\circ$

Part B: Practice Questions

★★ Medium Level

9. A triangle has angles measuring 60° and 70° . Find the third angle.

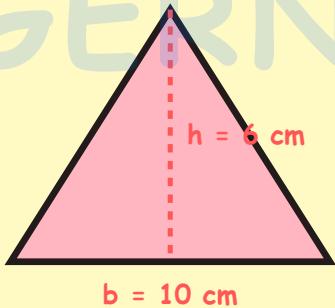


Sum of angles in triangle = 180°

Third angle = $180^\circ - \underline{\hspace{1cm}} - \underline{\hspace{1cm}} = \underline{\hspace{1cm}}^\circ$

10. Find the area of a triangle with base 10 cm and height 6 cm.

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Area = $\frac{1}{2} \times \text{base} \times \text{height}$

Area = $\frac{1}{2} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}} \text{ cm}^2$

11. A rectangular garden is 15 m long and 8 m wide. Find:

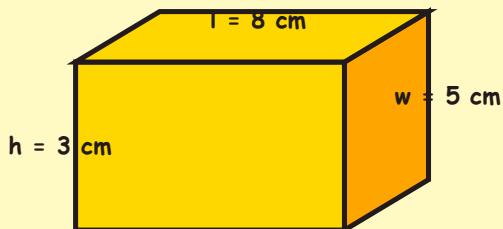
a) Perimeter = $\underline{\hspace{1cm}}$ m

b) Area = $\underline{\hspace{1cm}}$ m^2

c) If grass costs ₹10 per m^2 , how much will it cost to cover the entire garden?

₹ _____

12. Find the volume of a cuboid with length 8 cm, width 5 cm, and height 3 cm.



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Volume = length \times width \times height

Volume = _____ \times _____ \times _____ = _____ cm^3

13. True or False: When two lines intersect, vertically opposite angles are equal.

- True
- False

14. The distance between points A(1, 2) and B(1, 5) is:

Hint: Both points have the same x-coordinate (1), so find the difference in y-coordinates

Distance = _____ units

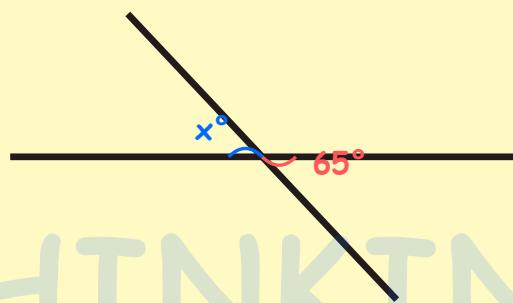
15. A square field has an area of 144 m^2 . What is the length of each side?

$$\text{Area} = \text{side}^2$$

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

$$\text{side} = \underline{\hspace{2cm}} \text{ m}$$

16. In the figure, find angle x :



Hint: Vertically opposite angles are equal

$$x = \underline{\hspace{2cm}}^\circ$$

17. A cube has a volume of 125 cm^3 . What is the length of one edge?

$$\text{Volume} = \text{side}^3$$

$$125 = \text{side}^3$$

$$\text{side} = \underline{\hspace{2cm}} \text{ cm}$$

18. Match the formulas:

Column A (Shape)

Column B (Area Formula)

a) Square	i) $\frac{1}{2} \times \text{base} \times \text{height}$
b) Rectangle	ii) side^2
c) Triangle	iii) $\text{length} \times \text{width}$

Write your answers: a-____, b-____, c-____

Part C: Challenge Questions

★★★ Hard Level

19. A rectangular room is 6 m long and 4 m wide. The floor needs to be covered with square tiles of side 50 cm. How many tiles are needed?

Step 1: Convert room dimensions to cm

$$\text{Length} = 6 \text{ m} = \text{_____ cm}$$

$$\text{Width} = 4 \text{ m} = \text{_____ cm}$$

Step 2: Find area of room

$$\text{Area of room} = \text{_____ cm}^2$$

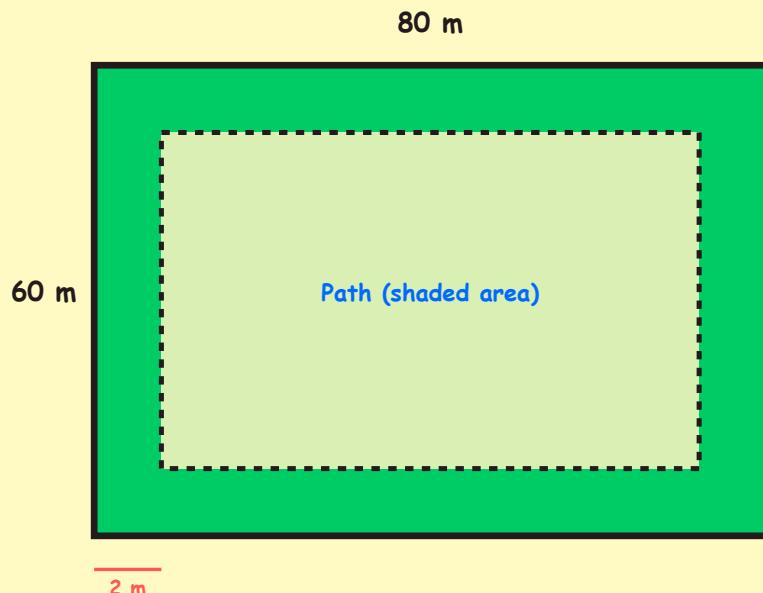
Step 3: Find area of one tile

$$\text{Area of tile} = 50 \times 50 = \text{_____ cm}^2$$

Step 4: Find number of tiles

$$\text{Number of tiles} = \text{Area of room} \div \text{Area of tile} = \text{_____}$$

20. A rectangular park is 80 m long and 60 m wide. A path 2 m wide runs around the inside of the park. Find the area of the path.



Outer area (whole park) = $80 \times 60 = \underline{\hspace{2cm}}$ m^2

Inner length = $80 - (2 + 2) = \underline{\hspace{2cm}}$ m

Inner width = $60 - (2 + 2) = \underline{\hspace{2cm}}$ m

Inner area = $\underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$ m^2

Area of path = Outer area - Inner area = $\underline{\hspace{2cm}}$ m^2

21. The coordinates of three vertices of a rectangle are A(2, 3), B(8, 3), and C(8, 7). Find:

- The coordinates of the fourth vertex D: ($\underline{\hspace{2cm}}, \underline{\hspace{2cm}}$)
- Length of the rectangle = $\underline{\hspace{2cm}}$ units
- Width of the rectangle = $\underline{\hspace{2cm}}$ units
- Area of the rectangle = $\underline{\hspace{2cm}}$ square units

22. A water tank in the shape of a cuboid is 2 m long, 1.5 m wide, and 1 m high. How many liters of water can it hold?

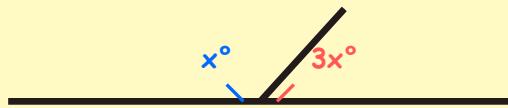
Hint: $1 \text{ m}^3 = 1000 \text{ liters}$

Volume = length × width × height

Volume = _____ × _____ × _____ = _____ m^3

Capacity = _____ m^3 × 1000 = _____ liters

23. Two angles form a linear pair (they are on a straight line). If one angle is three times the other, find both angles.



Angles on a straight line = 180°

$$x + 3x = 180^\circ$$

$$4x = 180^\circ$$

$$x = \underline{\hspace{2cm}}^\circ$$

$$3x = \underline{\hspace{2cm}}^\circ$$

24. Complex Problem: A rectangular field $100 \text{ m} \times 80 \text{ m}$ has a gravel path of uniform width running all around inside it. The area covered by the path is 1584 m^2 . Find the width of the path.

Let width of path = x meters

$$\text{Outer area} = 100 \times 80 = \underline{\hspace{2cm}} \text{ m}^2$$

$$\text{Inner length} = 100 - 2x$$

$$\text{Inner width} = 80 - 2x$$

$$\text{Inner area} = (100 - 2x)(80 - 2x)$$

$$\text{Area of path} = \text{Outer area} - \text{Inner area} = 1584$$

$$8000 - (100 - 2x)(80 - 2x) = 1584$$

$$(100 - 2x)(80 - 2x) = 6416$$

Try $x = 2$: $(100-4)(80-4) = 96 \times 76 = \underline{\hspace{2cm}} \times$

Try $x = 3$: $(100-6)(80-6) = 94 \times 74 = \underline{\hspace{2cm}} \times$

Try $x = 4$: $(100-8)(80-8) = 92 \times 72 = \underline{\hspace{2cm}} \checkmark$

Width of path = m



Answer Key

Part A: Warm-up Questions

1. Area = side \times side = side² (or side squared)

2. Area = $6 \times 6 = 36 \text{ cm}^2$

3. True

4. Other angle = $90^\circ - 30^\circ = 60^\circ$

5. Volume = $4^3 = 4 \times 4 \times 4 = 64 \text{ cm}^3$

6. Student should plot a point 3 units right and 4 units up from the origin

7. Perimeter = $2 \times (10 + 5) = 30 \text{ m}$; Area = $10 \times 5 = 50 \text{ m}^2$

8. Each angle = $180^\circ \div 2 = 90^\circ$

Part B: Practice Questions

9. Third angle = $180^\circ - 60^\circ - 70^\circ = 50^\circ$

10. Area = $\frac{1}{2} \times 10 \times 6 = \frac{1}{2} \times 60 = 30 \text{ cm}^2$

11. a) Perimeter = $2 \times (15 + 8) = 46$ m; b) Area = $15 \times 8 = 120$ m²; c) Cost = $120 \times ₹10 = ₹1,200$

12. Volume = $8 \times 5 \times 3 = 120$ cm³

13. True (Vertically opposite angles are always equal)

14. Distance = $5 - 2 = 3$ units

15. side = $\sqrt{144} = 12$ m

16. $x = 65^\circ$ (vertically opposite angles are equal)

17. side = $\sqrt[3]{125} = 5$ cm (because $5 \times 5 \times 5 = 125$)

18. a-ii, b-iii, c-i

Part C: Challenge Questions

19. Length = 600 cm, Width = 400 cm; Area of room = 240,000 cm²; Area of tile = 2,500 cm²; Number of tiles = $240,000 \div 2,500 = 96$ tiles

20. Outer area = 4,800 m²; Inner length = 76 m; Inner width = 56 m; Inner area = 4,256 m²; Area of path = $4,800 - 4,256 = 544$ m²

21. a) D(2, 7); b) Length = $8 - 2 = 6$ units; c) Width = $7 - 3 = 4$ units; d) Area = $6 \times 4 = 24$ square units

22. Volume = $2 \times 1.5 \times 1 = 3$ m³; Capacity = $3 \times 1000 = 3,000$ liters

23. $x = 45^\circ$; $3x = 135^\circ$ (The two angles are 45° and 135°)

24. $x = 2: 96 \times 76 = 7,296$ X; $x = 3: 94 \times 74 = 6,956$ X; $x = 4: 92 \times 72 = 6,624$ X; Actually $x = 4$ gives $8000 - 6624 = 1376$. Let's verify: The correct answer is $x = 4$ m (when checked: outer area - inner area should equal 1584)

Scoring Guide

Total Questions: 24 | Total Marks: 24

Score Range	Performance Level	What to Do Next
20-24	★★★ Excellent!	Outstanding performance! You've mastered Class 5 geometry. Next steps: Start learning about circles (circumference, area), explore more coordinate geometry, study geometric constructions with compass and ruler, learn about surface area of 3D shapes, and begin exploring ratio and proportion in geometry.
15-19	★★ Very Good!	Great job! You understand advanced geometry well. Focus on: Practice area and volume problems daily. Master angle relationships (complementary, supplementary, vertically opposite). Work on word problems involving area and perimeter. Practice plotting points on coordinate grids. Solve multi-step geometry problems.
10-14	★ Good Effort!	Good start! You're learning advanced concepts. Work on: Memorize area formulas (square, rectangle, triangle). Practice volume calculations for cube and cuboid. Understand angle relationships thoroughly. Start with simpler coordinate geometry problems. Break down complex problems into smaller steps.
0-9	Keep Trying!	Don't give up! These are challenging concepts. Start with: Master perimeter first before moving to area. Learn one formula at a time. Use graph paper to understand area visually. Practice basic angle facts. Work with your teacher on fundamental concepts. Do 3-5 simple problems daily until confident.

Tips for Mastering Class 5 Geometry:

- **Area Formulas - Must Know:**

- Square: $\text{Area} = \text{side}^2$ ($\text{side} \times \text{side}$)
- Rectangle: $\text{Area} = \text{length} \times \text{width}$
- Triangle: $\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$
- Remember: Area is always in square units (cm^2 , m^2 , km^2)

- **Volume Formulas - Must Know:**

- Cube: $\text{Volume} = \text{side}^3$ ($\text{side} \times \text{side} \times \text{side}$)

- Cuboid: Volume = length × width × height
- Remember: Volume is always in cubic units (cm³, m³)
- **Angle Relationships:**
 - Complementary angles: Add to 90°
 - Supplementary angles: Add to 180°
 - Vertically opposite angles: Always equal
 - Angles in a triangle: Always add to 180°
 - Angles in a quadrilateral: Always add to 360°
- **Coordinate Geometry Basics:**
 - Points are written as (x, y)
 - x tells you how far right, y tells you how far up
 - Origin is at (0, 0)
 - Distance between points with same x or y is easy to find
- **Problem-Solving Strategy:**
 - Read the problem carefully - twice!
 - Draw a diagram if not given
 - Write down the formula you need
 - Substitute the values
 - Calculate step by step
 - Check if your answer makes sense
- **Unit Conversion Tips:**
 - 1 m = 100 cm, so 1 m² = 10,000 cm²
 - 1 m³ = 1,000,000 cm³
 - 1 m³ = 1,000 liters
 - Always convert to the same units before calculating
- **Practice Techniques:** Use graph paper for coordinate geometry, draw shapes to visualize area problems, use building blocks to understand volume

✨ Great Job Completing This Worksheet! ✨

Keep practicing geometry and you'll master mathematics!

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