

## Area Of Complex Shapes Worksheet

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### Part 1: Building a Foundation

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#### What is the formula for the area of a rectangle?

*Hint: Think about how you calculate the area using length and width.*

- Length + Width
- Length  $\times$  Width
- $2 \times (\text{Length} + \text{Width})$
- Length  $\times$  Length

#### Which of the following are basic geometric shapes used to decompose complex shapes?

*Hint: Consider the shapes that can be combined to form other shapes.*

- Triangle
- Hexagon
- Circle
- Rectangle

#### Explain why it is important to decompose complex shapes into simpler shapes when calculating area.

*Hint: Think about how simpler shapes can make calculations easier.*

**List the formulas for calculating the area of a triangle and a circle.**

*Hint: Recall the basic formulas for these shapes.*

1. Area of a triangle

2. Area of a circle

**What is the area of a circle with a radius of 3 units?**

*Hint: Use the formula for the area of a circle.*

- $9\pi$  square units
- $6\pi$  square units
- $3\pi$  square units
- $12\pi$  square units

## Part 2: Application and Analysis

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**A park is shaped like a rectangle with a semicircle on one end. If the rectangle is 20 meters long and 10 meters wide, and the semicircle has a diameter of 10 meters, what is the total area of the park?**

*Hint: Calculate the area of both shapes and add them together.*

- $200 + 25\pi$  square meters
- $200 + 50\pi$  square meters
- $100 + 25\pi$  square meters
- $100 + 50\pi$  square meters

**In which scenarios would you need to calculate the area of complex shapes?**

*Hint: Think about practical applications of area calculations.*

- Designing a garden layout
- Creating a mosaic pattern
- Estimating paint needed for a wall
- Planning a city park

**A triangular garden plot has a base of 15 meters and a height of 10 meters. If a circular fountain with a radius of 2 meters is placed in the garden, calculate the remaining area of the garden.**

*Hint: Calculate the area of the triangle and the circle, then subtract.*

**If two shapes overlap, how can you find the area of the combined shape?**

*Hint: Consider how to account for the overlapping area.*

- Add the areas of both shapes
- Subtract the overlapping area from the total
- Multiply the areas of both shapes
- Divide the area of one shape by the other

**Analyze a complex shape made of a rectangle and a triangle. The rectangle has dimensions 8 cm by 5 cm, and the triangle has a base of 8 cm and a height of 3 cm. Calculate the total area and explain your process.**

*Hint: Calculate the area of each shape and add them together.*

### Part 3: Evaluation and Creation

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**A floor plan includes a rectangular living room and a semicircular bay window. If the living room is 12 meters by 8 meters and the bay window has a radius of 4 meters, what is the most efficient way to calculate the total area?**

*Hint: Consider the best method for combining areas.*

- Calculate each area separately and add them
- Estimate the area of the bay window and add it to the living room
- Multiply the areas of the living room and bay window
- Ignore the bay window area as it is negligible

**When designing a new park with complex shapes, what factors should be considered?**

*Hint: Think about the practical aspects of park design.*

- Accessibility and pathways
- Total area for recreational activities
- Aesthetic appeal and symmetry
- Cost of materials and maintenance

**Design a complex shape for a new garden that includes at least three different basic shapes. Describe your design and calculate the total area.**

*Hint: Think creatively about how to combine shapes.*

**Evaluate the following scenario: A complex shape is made of a square and a quarter circle. The square has a side length of 10 meters, and the quarter circle has a radius of 10 meters. Calculate the total area and justify your approach.**

*Hint: Calculate the area of both shapes and explain your reasoning.*

1. Area of the square

2. Area of the quarter circle