

Find The Perimeter And Area Of The Figure. Round To The Nearest Tenth If Necessary. 33.7 Mm; 108 Mm²

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Understanding how to calculate the perimeter and area of a figure is fundamental in geometry, whether you're a student working on homework or a professional involved in design and construction. In this article, we'll explore the steps to find the perimeter and area of a given figure, specifically focusing on a shape with a known length of 33.7 millimeters and an area of 108 square millimeters. We'll discuss the concepts, formulas, and practical methods to arrive at accurate measurements, rounding to the nearest tenth when necessary.

Understanding Perimeter and Area

Before delving into calculations, it's essential to clarify what perimeter and area represent:

- **Perimeter:** The total length of the boundary of a two-dimensional figure. Think of it as the distance you would travel if you walked around the shape.
- **Area:** The amount of space enclosed within the boundaries of a figure, measured in square units.

Both measurements are vital in various applications, from designing materials to land surveying.

Analyzing the Given Data

The problem provides two key pieces of information:

1. A length measurement: 33.7 mm
2. An area measurement: 108 mm²

However, without a specific shape, these details are somewhat abstract. To accurately calculate perimeter and area, we need to identify or make assumptions about the shape involved.

Common Shapes and Their Formulas

Depending on the figure, different formulas apply:

- **Rectangle:** Perimeter = $2(\text{length} + \text{width})$; Area = $\text{length} \times \text{width}$
- **Square:** Perimeter = $4 \times \text{side}$; Area = side^2
- **Circle:** Perimeter (Circumference) = $2\pi r$; Area = πr^2
- **Triangle, parallelogram, trapezoid, etc.** Various formulas apply

Given the data, the most straightforward assumption is that the figure might be a rectangle or a square, as the length and area are provided.

Approach to Find Missing Dimensions

Step 1: Determine the Shape

Since only one length (33.7 mm) and area (108 mm²) are given, let's consider possible shapes:

- Rectangle: If one side is 33.7 mm, the other side (width) can be calculated using the area.
- Square: If the shape is a square, then all sides are equal, and the side length can be derived from the area.

Step 2: Calculate the Unknown Dimension

For a Rectangle:

- Known: length = 33.7 mm
- Area = length $\times$ width

Rearranged:

- width = Area / length = $108 \text{ mm}^2 / 33.7 \text{ mm} \approx 3.204 \text{ mm}$

Calculation:

$$108 \div 33.7 \approx 3.204$$

Rounded to the nearest tenth:

$$\text{Width} \approx 3.2 \text{ mm}$$

For a Square:

$$\text{- Side length} = \sqrt{\text{Area}} = \sqrt{108 \text{ mm}^2} \approx 10.392 \text{ mm}$$

Calculation:

$$\sqrt{108} \approx 10.392$$

Rounded to the nearest tenth:

$$\text{Side length} \approx 10.4 \text{ mm}$$

Step 3: Find the Perimeter

For the Rectangle:

$$\text{Perimeter} = 2 \times (\text{length} + \text{width})$$

$$= 2 \times (33.7 \text{ mm} + 3.204 \text{ mm})$$

$$= 2 \times 36.904 \text{ mm} \approx 73.8 \text{ mm}$$

Rounded to the nearest tenth:

$$\text{Perimeter} \approx 73.8 \text{ mm}$$

For the Square:

$$\text{Perimeter} = 4 \times \text{side length} \approx 4 \times 10.392 \text{ mm} \approx 41.6 \text{ mm}$$

Rounded to the nearest tenth:

$$\text{Perimeter} \approx 41.6 \text{ mm}$$

Note: The actual shape affects the calculations. If the shape is different, the formulas and results will vary accordingly.

Practical Applications and Real-World Examples

Calculating perimeter and area has numerous applications:

- Landscaping: Determining fencing length (perimeter) and garden area.
- Manufacturing: Calculating material needed for fabrications.
- Interior Design: Estimating paint or wallpaper coverage.
- Educational Purposes: Reinforcing geometry concepts.

Let's explore some real-world scenarios:

Example 1: Fencing a Rectangular Garden

Suppose you have a garden that measures 33.7 meters in length and has an area of 108 square meters. To enclose the garden, you need to know the total length of fencing required.

- Calculate the width: $108 \div 33.7 \approx 3.204$ meters
- Calculate perimeter: $2 \times (33.7 + 3.204) \approx 73.8$ meters

Example 2: Designing a Square Tile

If a square tile has an area of 108 mm², the side length is approximately 10.4 mm. Knowing this, you can determine how many tiles are needed for a surface of a certain size.

Summary of Calculation Steps

To find the perimeter and area of a figure given partial data:

1. Identify the shape based on the data or assumptions.
2. Calculate missing dimensions using relevant formulas:
 - For rectangles: $\text{width} = \text{area} / \text{length}$
 - For squares: $\text{side} = \sqrt{\text{area}}$
3. Compute perimeter with the appropriate formula:
 - Rectangle: $\text{perimeter} = 2 \times (\text{length} + \text{width})$
 - Square: $\text{perimeter} = 4 \times \text{side}$
4. Round measurements to the nearest tenth for precision.

Conclusion

Understanding how to find the perimeter and area of a figure is a vital skill in geometry, with practical implications across various fields. In this specific problem, given a length of 33.7 mm and an area of 108 mm², we deduced that:

- If the figure is a rectangle, the other side is approximately 3.2 mm, and the perimeter is about 73.8 mm.
- If it's a square, the side length is approximately 10.4 mm, and the perimeter is about 41.6 mm.

Always verify the shape and assumptions before performing calculations, and ensure to round your final answers to the nearest tenth for clarity and

precision. With practice, these calculations become straightforward and essential tools for solving real-world measurement problems efficiently.

Keywords: perimeter calculation, area calculation, geometry, rectangle, square, measurement, rounding, practical applications, formulas

Frequently Asked Questions

What is the perimeter of the figure if one side measures 33.7 mm and the total perimeter is to be calculated?

The perimeter is found by adding all the sides of the figure; if only one side length is given (33.7 mm), the other sides need to be known to compute the total perimeter. If the figure is a rectangle with length 33.7 mm and width known, then $\text{perimeter} = 2 \times (\text{length} + \text{width})$.

Given the area of the figure is 108 mm^2 , what could be the dimensions of the shape?

Possible dimensions depend on the shape. For example, if it's a rectangle with an area of 108 mm^2 and one side is 33.7 mm, then the other side can be found by dividing the area by 33.7 mm: $108 \div 33.7 \approx 3.2 \text{ mm}$.

How do you find the missing side length of a rectangle if the area is 108 mm^2 and one side is 33.7 mm?

You can find the missing side by dividing the area by the known side: $108 \text{ mm}^2 \div 33.7 \text{ mm} \approx 3.2 \text{ mm}$.

If a rectangle has a length of 33.7 mm and a width of approximately 3.2 mm, what is its perimeter?

$\text{Perimeter} = 2 \times (\text{length} + \text{width}) = 2 \times (33.7 \text{ mm} + 3.2 \text{ mm}) \approx 2 \times 36.9 \text{ mm} \approx 73.8 \text{ mm}$.

Round the calculated perimeter of approximately 73.8 mm to the nearest tenth. What is the result?

The perimeter rounded to the nearest tenth is 73.8 mm.

What is the importance of rounding to the nearest tenth in measurements like perimeter and area?

Rounding to the nearest tenth simplifies measurements for practical use and ensures clarity without significantly affecting accuracy, especially when dealing with real-world measurements.

Additional Resources

Find The Perimeter And Area Of The Figure. Round To The Nearest Tenth If Necessary. 33.7 Mm; 108 Mm²

Understanding how to find the perimeter and area of geometric figures is fundamental in mathematics, especially in geometry. The problem statement indicates a specific figure with dimensions and a given area, providing an excellent opportunity to explore the concepts of perimeter and area calculation, rounding techniques, and how to interpret geometric data effectively. This article delves into the methods for calculating the perimeter and area, discusses the significance of precision in measurements, and offers insights into practical applications of these calculations.

Understanding the Problem Statement

Before diving into calculations, it's essential to interpret the given data correctly. The problem mentions a figure with a measurement of 33.7 mm and an area of 108 mm². The goal is to determine both the perimeter and the area of the figure, rounding the results to the nearest tenth if necessary.

The key points are:

- A specific measurement of 33.7 mm, which could be a side length, height, or another dimension depending on the shape.
- An area of 108 mm², indicating the size of the surface covered by the figure.

To proceed, we need to identify the shape involved, as different figures require different formulas for perimeter and area.

Identifying the Shape

Given the data, the figure could be one of several common shapes, such as:

- Rectangle or square
- Triangle
- Circle
- Irregular polygon (less common, but possible)

Since the problem provides a single length (33.7 mm) and an area, a reasonable assumption is that the figure might be a rectangle, square, or a circle. To verify, let's analyze each possibility.

1. Rectangle or Square

- For a rectangle, $\text{area} = \text{length} \times \text{width}$.
- For a square, all sides are equal, and $\text{area} = \text{side}^2$.

2. Circle

- For a circle, $\text{area} = \pi \times r^2$.
- Perimeter (circumference) $= 2\pi r$.

Calculating the Perimeter and Area for a Rectangle

Suppose the figure is a rectangle with one side measuring 33.7 mm. The area is given as 108 mm^2 .

Step 1: Find the other side length

Area of rectangle:

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

Given:

$$108 \text{ mm}^2 = 33.7 \text{ mm} \times \text{width}$$

Solve for width:

$$\text{width} = \frac{108}{33.7} \approx 3.204 \text{ mm}$$

Step 2: Calculate the perimeter

Perimeter of rectangle:

$$P = 2 \times (\text{length} + \text{width})$$

Plugging in the values:

$$P = 2 \times (33.7 + 3.204) \approx 2 \times 36.904 = 73.808 \text{ mm}$$

Step 3: Round to the nearest tenth

$P \approx 73.8, \text{ mm}$

Summary for rectangle:

- Width ≈ 3.2 mm
- Perimeter ≈ 73.8 mm
- Area = 108 mm^2 (given)

Calculating the Perimeter and Area for a Circle

If the figure is a circle with an area of 108 mm^2 , we can find the radius and then the perimeter.

Step 1: Find the radius

Area of circle:

$$A = \pi r^2$$

Solve for r:

$$r = \sqrt{\frac{A}{\pi}}$$

Calculate:

$$r = \sqrt{\frac{108}{3.1416}} \approx \sqrt{34.365} \approx 5.86, \text{ mm}$$

Step 2: Calculate the perimeter (circumference)

$$C = 2 \pi r \approx 2 \times 3.1416 \times 5.86 \approx 36.8, \text{ mm}$$

Step 3: Round to the nearest tenth

$$C \approx 36.8, \text{ mm}$$

Discussion of Results and Practical Implications

The calculations reveal the importance of understanding the shape involved when interpreting measurement data. For the rectangle case, the longer side measures 33.7 mm , with a comparatively small width, indicating a very elongated rectangle. The perimeter is approximately 73.8 mm , which could be useful in contexts such as cutting materials, framing, or fencing, where knowing the total boundary length is essential.

In the circle scenario, the radius of approximately 5.86 mm and a circumference of about 36.8 mm provide useful information for applications like designing circular components, calculating material requirements, or understanding spatial layouts.

Features and Pros/Cons

Feature	Pros	Cons
Precise measurement rounding	Ensures accuracy in real-world applications	Slight variations can impact results in sensitive contexts
Multiple shape assumptions	Allows flexibility in problem-solving	Assumptions may lead to inaccuracies if the shape is different
Use of standard formulas	Simplifies calculations	Requires correct shape identification

Critical Considerations in Geometry Calculations

- Rounding: Always round to the nearest tenth unless specified otherwise, as small deviations can affect subsequent calculations or applications.
 - Shape Identification: Correctly identifying the figure is crucial. Using the wrong formula can lead to significant errors.
 - Measurement Units: Consistency in units (mm in this case) simplifies calculations and avoids confusion.
 - Complex Figures: For irregular shapes, breaking the figure into known shapes or using approximation methods is necessary.
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Additional Tips for Geometry Problems

- Always verify the shape before choosing formulas.
 - Use approximate values for π (3.1416) for high accuracy.
 - When given a single measurement, consider multiple possible shapes and verify which fits best with the given area.
 - Practice with different shapes to improve intuition and problem-solving skills.
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Conclusion

Determining the perimeter and area of a figure requires careful analysis of the given data, correct identification of the shape, and application of appropriate formulas. In this case, assuming the figure is a rectangle with one side measuring 33.7 mm and an area of 108 mm², the perimeter is approximately 73.8 mm. If the figure is a circle with an area of 108 mm², the circumference is approximately 36.8 mm.

These calculations are not only academically relevant but also have practical applications across engineering, architecture, manufacturing, and everyday problem-solving. Accurate measurement and understanding of geometric principles empower us to make informed decisions and optimize designs in real-world scenarios.

Final Note: Always double-check your assumptions and calculations, especially when working with figures where shape details are not explicitly provided. Practice with various shapes and data sets to strengthen your geometry skills.

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