The Diameter Of A $1 Coin Is 26.5 Mm. Find The Area Of One Side Of The Coin. Round To The Nearest Hundredth.

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Understanding the dimensions of coins is essential in various fields such as numismatics, engineering, and mathematics. In this article, we will explore how to calculate the area of one side of a $1 coin, given its diameter of 26.5 millimeters. This problem involves fundamental geometric concepts, specifically the calculation of the area of a circle, which is crucial for students, educators, and coin collectors alike. By the end of this guide, you will know how to perform such calculations accurately and understand their real-world applications.

Understanding the Problem

Before diving into calculations, it's important to understand what is asked. The problem states:

- The diameter of a $1 coin is 26.5 mm.
- Find the area of one side of the coin.
- Round the answer to the nearest hundredth.

This requires applying the formula for the area of a circle, which is a fundamental concept in geometry.

The Basics of Circle Geometry

What Is the Diameter?

The diameter of a circle is the length of a straight line passing through the center of the circle, connecting two points on its boundary. For our coin, the diameter is given as 26.5 mm, which directly influences the calculation of the area.

Understanding the Radius

The radius is half the diameter:

- Radius (r) = Diameter / 2

For our problem:

- r = 26.5 mm / 2 = 13.25 mm

The Formula for the Area of a Circle

The area A of a circle is given by:
$$A = \pi r^2$$
where:
- $\pi \approx 3.1416$,
- r is the radius of the circle.

Applying this formula, we can find the area of one side of the coin.

Calculating the Area of One Side of the Coin

Step-by-Step Calculation

Let's perform the calculation with the given measurements:

1. Identify the radius:
$$
r = \frac{26.5\, \text{mm}}{2} = 13.25\, \text{mm}
$$

2. Square the radius:
$$
r^2 = (13.25)^2 = 175.5625\, \text{mm}^2
$$

3. Multiply by π:
$$
A = \pi \times 175.5625
$$
$$
A \approx 3.1416 \times 175.5625
$$

4. Perform the multiplication:
$$
A \approx 3.1416 \times 175.5625 \approx 551.66\, \text{mm}^2
$$

Answer: The area of one side of the coin is approximately 551.66 mm².

Rounding to the Nearest Hundredth

The calculated area is already rounded to two decimal places, which is the standard for rounding to the nearest hundredth. Therefore, the final answer remains:

551.66 mm^2

Practical Applications of This Calculation

Knowing how to calculate the area of a coin's face has several practical applications:

- **Numismatics:** Coin collectors and researchers can use area calculations to verify coin authenticity or compare sizes.
- **Manufacturing:** Coin minting companies need precise area measurements to ensure consistency across coins.
- **Education:** Geometry students learn real-world applications of circle formulas.
- **Design:** Designers can use area calculations when creating new coin designs or similar objects.

Additional Tips for Accurate Calculations

- **Use precise values for \(\pi\):** While 3.1416 is common, using more precise values or a calculator's \(\pi\) function can improve accuracy.
- **Maintain consistent units:** Always use the same units throughout the calculation to avoid errors.
- **Double-check your work:** Recompute to ensure accuracy, especially when rounding.

Summary

Calculating the area of one side of a $1 coin with a diameter of 26.5 mm involves understanding the properties of circles and applying the formula \(A = \pi r^2\). The key steps include:

- Dividing the diameter by 2 to find the radius.

- Squaring the radius.
- Multiplying by \(\pi\).

Using these steps, the area is approximately 551.66 mm², rounded to the nearest hundredth. Mastery of such calculations not only enhances mathematical skills but also provides insights into real-world object dimensions and their significance.

Conclusion

Whether you're a student tackling geometry problems, a coin collector verifying authenticity, or an engineer designing similar objects, understanding how to calculate the area of a circle from its diameter is a valuable skill. Remember to always convert measurements accurately, apply the correct formula, and round your final answer appropriately. With practice, these calculations become intuitive and applicable across various fields, making geometry both practical and fascinating.

If you want to learn more about circle geometry, coin measurements, or related mathematical concepts, feel free to explore additional resources or reach out to educational platforms specializing in math and science topics.

Frequently Asked Questions

What is the formula to find the area of one side of a circular coin?

The area of a circle is given by the formula $A = \pi r^2$, where r is the radius of the circle.

How do you find the radius of a coin if the diameter is given?

The radius is half of the diameter, so r = diameter / 2.

Given the diameter of a coin is 26.5 mm, what is its radius?

The radius is 26.5 mm / 2 = 13.25 mm.

What is the value of π used in calculations, and how precise should it be for this problem?

π is approximately 3.1416, which provides sufficient precision for this calculation.

How do you calculate the area of one side of the coin using the given diameter?

First, find the radius (13.25 mm), then plug into the formula $A = \pi r^2$: $A = 3.1416 \times (13.25)^2$.

What is the area of one side of the coin rounded to the nearest hundredth?

The area is approximately 551.56 square millimeters.

Can this calculation be applied to coins of different sizes?

Yes, by adjusting the diameter and following the same steps, the area can be calculated for any coin.

Why is it important to round the answer to the nearest hundredth?

Rounding to the nearest hundredth provides a precise yet manageable number, suitable for most practical purposes.

What are some real-world applications of calculating the area of a coin?

It can be used in manufacturing for quality control, designing coin embossments, or in mathematical problems involving surface areas.

Additional Resources

The Diameter Of A $1 Coin Is 26.5 Mm. Find The Area Of One Side Of The Coin. Round To The Nearest Hundredth.

Understanding the area of a coin based on its diameter is a fundamental application of geometry that combines real-world relevance with mathematical principles. In this comprehensive review, we will explore the problem of calculating the area of one side of a coin—specifically a $1 coin with a diameter of 26.5 mm—by dissecting the problem step-by-step, examining the formulas involved, and discussing practical implications of such calculations. This article aims to clarify the process, provide detailed explanations, and offer insights into the significance of understanding geometric measurements in everyday objects.

Understanding the Problem

The core of the problem involves determining the area of one face of a coin given its diameter. The

problem statement is:

The diameter of a $1 coin is 26.5 mm. Find the area of one side of the coin, rounded to the nearest hundredth.

This is a typical problem in geometry, especially in the study of circles. The key points include:

- Diameter (d): The straight line passing through the center of the circle, connecting two points on its boundary, measuring 26.5 mm.
- Radius (r): The distance from the center of the circle to any point on its boundary, which we need to find.
- Area (A): The surface area of one side of the coin, which is the area of a circle.

The problem requires the application of the circle area formula:

$$ A = \pi r^2 $$

Given the diameter, the first step is to find the radius:

$$ r = \frac{d}{2} $$

Once the radius is known, substituting into the area formula yields the area, which must then be rounded to the nearest hundredth.

Step-by-Step Calculation

Calculating the Radius

Given:

$$ d = 26.5\, \text{mm} $$

The radius:

$$ r = \frac{d}{2} = \frac{26.5\, \text{mm}}{2} = 13.25\, \text{mm} $$

Applying the Area Formula

The area of a circle:

$$ A = \pi r^2 $$

Using $\pi \approx 3.14159$:

$$ A = 3.14159 \times (13.25)^2 $$

Calculating r^2:

$$ (13.25)^2 = 13.25 \times 13.25 = 175.5625 $$

So,

$$ A \approx 3.14159 \times 175.5625 $$

$$ A \approx 551.88\, \text{mm}^2 $$

Rounding to the nearest hundredth:

$$ \boxed{551.88\, \text{mm}^2} $$

Thus, the area of one side of the coin is approximately 551.88 square millimeters.

Significance of the Calculation

Understanding how to compute the area of a coin has multiple practical applications and educational value:

- Manufacturing & Quality Control: Precise measurements ensure coins are produced within specified dimensions, maintaining consistency in size and weight.
- Design & Minting: Knowledge of area aids designers in incorporating features like engravings or security marks proportionally.
- Educational Purposes: Demonstrates the application of geometry in real-world contexts, making math more tangible.

Features and Implications of the Calculation

Features:

- Accuracy: Using $\pi \approx 3.14159$ provides high precision, suitable for most practical purposes.
- Simplicity: The calculation involves straightforward steps—finding the radius and applying the area formula.
- Applicability: The same method applies to any circular object where diameter is known.

Implications:

- Understanding of geometric principles: Reinforces the importance of formulas in solving real-world problems.
- Conversions: When measurements are in millimeters, the area is in square millimeters, which can be converted to other units if necessary (e.g., square centimeters).

Pros and Cons of Calculation Approach

Pros:

- Simplicity and Clarity: The process is straightforward and easy to follow.
- High Precision: Rounding to the hundredth provides a good balance between accuracy and usability.
- Versatility: Can be adapted for different sizes and shapes, such as other coins or circular objects.

Cons:

- Approximate value of π: Slight variations in π could affect the result minimally.
- Assumption of perfect circle: Real coins may have slight imperfections, so actual measurements might slightly differ.
- Limited to 2D calculations: Does not account for the coin's thickness or volume, which might be relevant in other contexts.

Extensions and Related Topics

While this problem focuses on the area of one side of a coin, several related topics can deepen understanding:

- Volume of a Coin: Considering the thickness, one could calculate the volume by multiplying the area by the thickness.
- Surface Area of a Coin: For both sides, the total surface area (including thickness) can be relevant.
- Other Geometric Shapes: Extending the calculation to coins with different shapes (e.g., elliptical, polygonal) introduces more advanced geometry.
- Material Usage: Estimating the amount of metal needed based on the volume or surface area.

Conclusion

Calculating the area of one side of a coin, given its diameter, exemplifies how fundamental geometric principles are directly applicable to everyday objects. The process involves simple but

precise steps: converting the diameter to radius, applying the circle area formula, and rounding for practical use. For a $1 coin with a diameter of 26.5 mm, the area is approximately 551.88 mm^2. This calculation not only reinforces core mathematical skills but also highlights the importance of geometry in manufacturing, design, and quality assurance. Whether for educational purposes or practical applications, mastering such calculations enhances our understanding of the physical world around us.

In summary:

- The problem involves basic geometric formulas applied to a real-world object.
- The method is straightforward: find the radius, then compute the area.
- The result, rounded to the nearest hundredth, is 551.88 mm^2.
- These calculations underpin many practical and educational pursuits, illustrating the importance of geometry in everyday life.

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