

A Circle With A Radius Of 7 Ft Is Cut Into 6 Equal Pieces. How Many Sq Ft Are 2 Of The Pieces? Use 22/7

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Understanding geometric concepts such as areas of circles and how they are divided into equal parts is essential for various practical applications—from construction and design to education. In this article, we will explore the process of calculating the area of a circle with a given radius, dividing it into equal segments, and determining the area of specific segments based on their proportion of the whole. Using the approximation of π as $22/7$, we will walk through the step-by-step process of solving the problem: If a circle with a radius of 7 feet is cut into 6 equal pieces, what is the combined area of 2 of those pieces?

This comprehensive guide aims to clarify the mathematical procedures involved, explain relevant formulas, and provide useful insights to enhance your understanding of circle geometry.

Understanding the Basics: What Is the Area of a Circle?

Before diving into calculations, it's vital to understand what the area of a circle represents. The area of a circle indicates the space enclosed within its boundary. The fundamental formula for the area (A) of a circle is:

$$A = \pi r^2$$

where:

- A is the area,
- π (pi) is approximately 3.14159,
- r is the radius of the circle.

In this problem, the radius is given as 7 feet.

Using the Approximate Value of Pi: 22/7

While π is an irrational number with an infinite decimal expansion, mathematicians often use approximate values for practical calculations. In this case, we are instructed to use $22/7$ as an approximation for π . This fraction provides a convenient and reasonably accurate estimate for calculations involving circles.

The value of π used in calculations:

$$\pi \approx \frac{22}{7} \approx 3.142857$$

This approximation simplifies calculations and is particularly useful in educational contexts and when precise decimal values are not required.

Calculating the Area of the Circle

Given:

- Radius $(r = 7)$ ft
- $\pi \approx \frac{22}{7}$

Applying the area formula:

$$A = \pi r^2 = \frac{22}{7} \times 7^2$$

Step-by-step calculation:

1. Square the radius:

$$7^2 = 49$$

2. Multiply by π :

$$A = \frac{22}{7} \times 49$$

3. Simplify:

$$A = 22 \times \frac{49}{7}$$

Since 49 divided by 7 equals 7:

$$A = 22 \times 7 = 154$$

Result: The total area of the circle is 154 square feet.

Dividing the Circle Into Equal Pieces

The circle is cut into 6 equal parts, or sectors. Because the total area is divided equally:

- Each piece (sector) has an area equal to:

$$\text{Area of one piece} = \frac{\text{Total Area}}{\text{Number of pieces}} = \frac{154}{6}$$

Calculating:

$$\frac{154}{6} \approx 25.6667 \text{ sq ft}$$

Therefore, each piece has an area of approximately 25.67 square feet.

Finding the Area of 2 Pieces

The question asks: How many square feet are 2 of these pieces?

- Since each piece is approximately 25.67 sq ft:

$$\text{Area of 2 pieces} = 2 \times 25.67 \approx 51.33 \text{ sq ft}$$

Answer: The combined area of 2 pieces is approximately 51.33 square feet.

Summary of Calculations

Step	Calculation	Result
1	Area of circle using $\pi = 22/7$	154 sq ft
2	Area of one piece $(154/6 \approx 25.67)$	sq ft
3	Area of 2 pieces $(2 \times 25.67 \approx 51.33)$	sq ft

Additional Insights and Practical Applications

Understanding how to divide a circle into equal parts and calculate the areas of those parts has numerous real-life applications:

- Construction and Architecture: Determining materials needed for sectors of circular structures.
- Cooking and Baking: Dividing circular pizzas or cakes into equal slices.
- Educational Purposes: Teaching students about fractions, areas, and circle geometry.
- Design and Art: Creating evenly divided circular patterns or motifs.

Practical Tips for Similar Problems

- Always verify whether you should use an approximate value of π or the more precise value.
- Remember that dividing the total area by the number of parts gives the area of each part.
- When dealing with fractions, simplify where possible to make calculations easier.
- Use consistent units throughout your calculations to avoid errors.

Conclusion

In summary, for a circle with a radius of 7 feet, the total area is 154 square feet when using the approximation $\pi \approx 22/7$. When this circle is cut into 6 equal pieces, each piece has an area of approximately 25.67 square feet. Therefore, the combined area of 2 such pieces is roughly 51.33 square feet.

Mastering these calculations enhances your understanding of circle geometry and prepares you to tackle more complex problems involving sectors, segments, and other geometric shapes. Whether applied in academics, professional projects, or everyday tasks, these skills form the foundation of geometric reasoning and spatial awareness.

Remember: Practice makes perfect. Try applying these steps to different circle sizes and divisions to strengthen your understanding and confidence in geometric calculations.

Frequently Asked Questions

What is the total area of a circle with a radius of 7 feet using $22/7$ as π ?

The total area is $(22/7) \times 7 \times 7 = 154$ square feet.

If a circle with a radius of 7 feet is divided into 6 equal parts, what is the area of each piece?

Each piece has an area of $154 \div 6 \approx 25.67$ square feet.

How much area do 2 of the equal pieces from the circle cover?

Two pieces cover approximately $25.67 \times 2 \approx 51.33$ square feet.

What formula is used to find the area of the circle in this problem?

The formula used is $\text{Area} = (22/7) \times \text{radius} \times \text{radius}$.

How do you find the area of one of the six equal pieces of the circle?

Divide the total area of the circle by 6: $154 \div 6 \approx 25.67$ sq ft.

Is it necessary to convert π to $22/7$ for this calculation, and why?

Yes, using $22/7$ as an approximation of π simplifies the calculation and provides an accurate estimate.

If you want the area of two pieces, what calculation should you perform?

Multiply the area of one piece by 2: $(154 \div 6) \times 2 \approx 51.33$ square feet.

Additional Resources

A Circle With A Radius Of 7 Ft Is Cut Into 6 Equal Pieces. How Many Sq Ft Are 2 Of The Pieces? Use $22/7$

Understanding the geometry behind circles and their subdivisions is fundamental in numerous fields, from architecture to engineering. In this article, we explore a practical problem: determining the combined area of two equal segments obtained by dividing a circle into six parts. Using the given radius and the approximation of π as $22/7$, we will walk through the calculations step-by-step, ensuring clarity for readers with varying levels of mathematical background.

Introduction to Circle Geometry and the Problem Statement

The problem at hand involves a circle with a given radius of 7 feet. This circle is divided into six equal parts, essentially creating six sectors. The question posed is: What is the combined area of two of these sectors?

To solve this, we need to understand the basic formulas governing circles:

- Area of a circle: $(A = \pi r^2)$
- Circumference of a circle: $(C = 2\pi r)$
- Area of a sector: $(\text{Sector Area} = \frac{\theta}{360^\circ} \times \pi r^2)$

Here, (θ) is the central angle of the sector in degrees.

Given that the circle is divided into six equal parts, each sector has an angle of $(360^\circ / 6 = 60^\circ)$.

Calculating the Total Area of the Circle

Before determining the area of individual sectors, we need the total area of the circle using the given radius and the approximation $(\pi = \frac{22}{7})$.

Step 1: Applying the Area Formula

The formula for the area of the circle becomes:

$$A = \pi r^2 = \frac{22}{7} \times 7^2$$

Step 2: Simplify the Calculation

Calculate:

$$A = \frac{22}{7} \times 49$$

Since 49 divided by 7 is 7, this simplifies to:

$$A = 22 \times 7 = 154$$

Result: The total area of the circle is 154 square feet.

Determining the Area of One Sector

Since the circle is divided into six equal sectors, each sector's area is a fraction of the total.

Step 1: Find the Area of a Single Sector

Given:

- Total area = 154 sq ft
- Number of sectors = 6
- Each sector's central angle = 60°

The sector's area:

$$\text{Sector Area} = \frac{\theta}{360^\circ} \times \text{Total Area}$$

Substituting values:

$$\text{Sector Area} = \frac{60^\circ}{360^\circ} \times 154$$

$$\text{Sector Area} = \frac{1}{6} \times 154 = 25.666\ldots \text{ sq ft}$$

Result: Each sector measures approximately 25.67 sq ft.

Calculating the Area of Two Equal Sectors

Since the question asks for the combined area of two of these sectors, it's straightforward:

$$\text{Combined Area} = 2 \times \text{Sector Area} = 2 \times 25.67 \approx 51.33 \text{ sq ft}$$

Final result: The total area of two sectors is approximately 51.33 square feet.

Summary of the Calculation Process

To recap, the key steps involved:

1. Calculate the total area of the circle using the given radius and the approximation $\pi = 22/7$.
2. Determine the area of a single sector by dividing the total area by the number of sectors.
3. Multiply the sector area by two to find the combined area of two sectors.

This approach hinges on a fundamental understanding of circle geometry and proportional reasoning, making it applicable to various practical scenarios such as land division, material cutting, or even designing circular layouts.

Additional Insights and Practical Applications

Understanding how to compute portions of a circle is not just an academic exercise but has real-world implications:

- Land Planning: Dividing circular plots into equal sections for development.
- Manufacturing: Cutting circular sheets into equal parts for product design.
- Architecture: Designing circular windows or structures with subdivided sections.
- Education: Teaching the concepts of fractions, angles, and areas in geometry.

Moreover, the approximation of π as $22/7$ is a common practical choice, especially in contexts where simplicity and quick calculations are valued. While it offers a close approximation, for more precise calculations, especially in engineering, more accurate values of π are used.

Conclusion: Embracing Simplicity with Effective Approximations

In conclusion, dividing a circle into equal parts and calculating the combined area of selected segments is a fundamental skill in geometry with extensive applications. Using the approximation $\pi = 22/7$, the problem becomes manageable and straightforward, yielding a total of approximately 51.33 square feet for two sectors of a circle with a 7-foot radius divided into six parts.

This exercise underscores the importance of understanding core geometric principles and the utility of approximations in practical calculations. Whether in construction, design, or education, such knowledge enables professionals and learners alike to make informed decisions and accurate estimations in their respective fields.

Note: For more precise calculations, especially in contexts demanding high accuracy, consider using the more exact value of π (approximately 3.14159).

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