

The Cost Of Putting Grass In A Square Lawn Is 3888 At 12 Per Square Metre Find The Length Of Yhe Side

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Are you planning to install grass on your square lawn and wondering about the total costs involved? Understanding how to determine the size of your lawn based on the total expenditure and the cost per square metre is essential for accurate budgeting and planning. In this article, we will explore the problem: The cost of putting grass in a square lawn is 3888 at 12 per square metre, and how to find the length of the side of the lawn. We will break down the steps involved in solving this problem, discuss related concepts, and provide useful tips for calculating lawn areas effectively.

Understanding the Basics of Lawn Area Calculation

Before delving into the specific problem, it's important to understand the fundamental concepts involved in calculating the area of a square lawn and how costs relate to area measurements.

What Is a Square Lawn?

A square lawn is a piece of land where all four sides are of equal length. The area of a square is calculated by squaring the length of one side.

Area of a Square

The formula for the area (A) of a square with side length (s) is:

- $A = s^2$

Where:

- A is the area in square metres
- s is the length of one side in metres

Cost Calculation Based on Area

When installing grass, the total cost is often calculated based on the area, with a specific rate per square metre.

- $\text{Total Cost} = \text{Area} \times \text{Cost per Square Metre}$

In our problem, the total cost and cost per square metre are provided, allowing us to determine the lawn's dimensions.

Breaking Down the Problem: Find the Side Length of the Lawn

Given:

- Total cost of installing grass = 3888
- Cost per square metre = 12

Our goal:

- Find the length of one side of the square lawn (s).

Step 1: Determine the Area of the Lawn

Using the formula for total cost:

- $\text{Total Cost} = \text{Area} \times \text{Cost per Square Metre}$

Rearranged to find the area:

- $\text{Area} = \text{Total Cost} \div \text{Cost per Square Metre}$

Substituting the known values:

- $\text{Area} = 3888 \div 12 = 324 \text{ square metres}$

Therefore, the total area of the lawn is 324 square metres.

Step 2: Calculate the Side Length of the Square Lawn

Recall the formula for the area of a square:

- $A = s^2$

Rearranged to find s :

- $s = \sqrt{A}$

Substituting the area:

- $s = \sqrt{324} = 18$ metres

Thus, the length of each side of the lawn is 18 metres.

Additional Considerations and Tips for Lawn Area Calculations

Understanding the process of calculating the side length based on cost and area is useful for many landscaping projects. Here are some additional tips and related concepts to enhance your understanding.

1. Double-Check Your Calculations

Always verify your calculations, especially when dealing with large numbers or multiple steps, to avoid errors.

2. Use Accurate Measurements

Ensure that your measurements and cost estimates are precise to get an accurate calculation of the lawn size.

3. Consider Extra Costs

Remember to account for additional costs such as soil preparation, delivery fees, or landscaping services, which might not be included in the initial cost calculation.

4. Convert Units If Necessary

If measurements are given in different units, convert them to a consistent system before performing calculations.

Practical Applications of the Calculation

Knowing how to find the side length of a square lawn based on cost can be beneficial in various scenarios:

- Estimating the amount of materials needed for landscaping projects
- Budget planning for garden renovations
- Designing custom-sized lawns to fit specific spaces
- Understanding cost implications of different lawn sizes

Summary

To summarize, when given the total cost of installing grass in a square lawn and the cost per square metre, you can determine the side length by following these steps:

1. Calculate the lawn's area by dividing the total cost by the cost per square metre.
2. Find the square root of the area to determine the length of one side.

Applying this method to our problem:

- Total cost = 3888
- Cost per square metre = 12
- Area = $3888 \div 12 = 324 \text{ m}^2$
- Side length = $\sqrt{324} = 18 \text{ metres}$

Therefore, the side of the square lawn measures 18 metres.

By mastering these calculations, you can confidently plan and execute lawn projects, ensuring accurate budgeting and optimal use of space.

If you need further assistance with similar calculations or lawn design ideas, feel free to ask!

Frequently Asked Questions

What is the total area of the square lawn if the cost to put grass is 3888 at 12 per square metre?

The total area is calculated by dividing the total cost by the cost per square metre: $3888 \div 12 = 324$ square metres.

How do you find the length of a side of a square given its area?

The length of a side is the square root of the area. So, side length = $\sqrt{\text{area}}$.

What is the side length of the square lawn in this problem?

The side length is $\sqrt{324} = 18$ metres.

If the cost per square metre increases to 15, what would be the new total cost for the same lawn?

New total cost = area $\times$ new cost per square metre = $324 \times 15 = 4860$.

How is the cost of grass related to the area of the lawn?

The total cost is directly proportional to the area; as the area increases, so does the cost.

Can you verify the area using the given cost and rate per square metre?

Yes, dividing the total cost by the rate per square metre ($3888 \div 12$) confirms the area as 324 square metres.

What formula is used to find the side length of a square when given the area?

Side length = $\sqrt{(\text{area})}$.

If the side length of the lawn is 18 metres, what is the perimeter of the square?

Perimeter = $4 \times \text{side length} = 4 \times 18 = 72$ metres.

Why is it important to know the cost per square metre when planning lawn installation?

Knowing the cost per square metre helps in estimating the total expense accurately and planning the budget effectively.

Additional Resources

The Cost of Putting Grass in a Square Lawn Is 3888 At 12 Per Square Metre:
Find the Length of the Side

When it comes to landscaping and creating lush, green outdoor spaces, understanding the relationship between cost, area, and dimensions is crucial. Whether you are a homeowner planning to upgrade your garden or a student tackling a geometry problem, analyzing the cost of planting grass in a square lawn offers valuable insights into practical applications of mathematics. This comprehensive review delves into the problem of determining the side length of a square lawn based on its total cost and cost per square metre, exploring the mathematical principles involved, real-world implications, and detailed problem-solving steps.

Understanding the Problem: Cost, Area, and Dimensions

Before diving into calculations, it's essential to comprehend the core components of the problem:

- Total Cost: 3888 (currency units, e.g., dollars, rupees, etc.)
- Cost Per Square Metre: 12
- Shape of the Lawn: Square
- Objective: Find the length of one side of the square lawn.

This problem essentially asks: Given the total expenditure on grass and the cost per unit area, what is the length of each side of the square lawn?

Breaking Down the Components

1. Cost and Area Relationship

The total cost of planting grass depends directly on the area of the lawn:

$$\text{Total Cost} = \text{Area} \times \text{Cost per Square Metre}$$

This linear relationship allows us to find the area if the total cost and unit cost are known:

$$\text{Area} = \frac{\text{Total Cost}}{\text{Cost per Square Metre}}$$

2. Area of a Square

For a square:

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

Where the side length is what we're trying to find. Once the area is known, taking its square root will give the length of the side.

Step-by-Step Solution Approach

To accurately determine the side length, follow these steps:

Step 1: Calculate the Area

Using the given total cost and cost per square metre:

$$\text{Area} = \frac{3888}{12} = 324 \text{ square metres}$$

This means the total area of the lawn is 324 m².

Step 2: Find the Side Length of the Square

Since the area of a square is side squared:

$$\text{Side}^2 = 324$$

Taking the square root:

$$\text{Side} = \sqrt{324} = 18 \text{ metres}$$

Result: The side length of the lawn is 18 metres.

Implications and Real-World Applications

Understanding the calculation process provides significant benefits beyond just solving a math problem:

- Landscaping Planning: Homeowners and landscapers can estimate costs and dimensions before starting a project.
- Budget Management: Knowing the cost per square metre helps in budgeting for large or small areas.
- Design Optimization: Adjusting the size or shape of the lawn to fit specific space constraints while controlling costs.
- Educational Value: Reinforces understanding of geometric formulas and proportional reasoning.

Additional Considerations and Variations

While the basic problem is straightforward, real-world scenarios often involve additional factors:

1. Cost Variations

- Different grass types or quality grades may have different costs per square metre.
- Installation fees, soil preparation, or delivery charges might add to the base cost.

2. Shape and Dimensions

- Non-square lawns (rectangular, irregular) require different area and perimeter calculations.
- For rectangular lawns, if the length and width are known or related, similar methods can be applied.

3. Scaling and Conversion

- When working with different units (e.g., yards, feet), conversions are necessary.
- 1 metre = 3.28084 feet; thus, the side length in feet would be $(18 \times 3.28084 \approx 59.06)$ feet.

Mathematical Generalization and Formulas

The problem exemplifies fundamental geometric and algebraic principles. Here are key formulas and generalizations:

- Total Cost Formula:

$$\text{Total Cost} = \text{Area} \times \text{Cost per Square Metre}$$

- Area of Square:

$$A = s^2$$

- Side Length Calculation:

$$s = \sqrt{\frac{\text{Total Cost}}{\text{Cost per Square Metre}}}$$

This formula can be adapted to other shapes and cost scenarios by adjusting the area calculation accordingly.

Conclusion: Summarizing the Findings

The problem of determining the side length of a square lawn given the total cost and cost per square metre is an excellent example of applying basic algebra and geometry in practical contexts. By understanding the relationships between cost, area, and dimensions, we can arrive at the clear conclusion:

> The side length of the lawn is 18 metres.

This calculation demonstrates how simple formulas, when correctly applied, enable effective planning, budgeting, and problem-solving in landscaping and beyond.

Final Thoughts and Recommendations

- Always verify the units used in calculations to avoid errors.
- When planning large projects, consider potential additional costs and contingencies.
- Use these principles to estimate costs for various sizes and shapes of lawns or other areas.
- Practice with different scenarios to strengthen understanding of proportionality and geometric relationships.

Whether you're a student mastering geometry or a homeowner planning a new garden, grasping the relationship between cost, area, and dimensions is invaluable for efficient and informed decision-making.

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