

Find The Cost Of Fencing A Rectangular Garden At The Rate Of Rs.7.5 Per M, If Its Length And Breadth

Find The Cost Of Fencing A Rectangular Garden At The Rate Of Rs.7.5 Per M, If Its Length And Breadth is a common problem in basic geometry and arithmetic that involves calculating the total fencing cost for a rectangular garden based on its dimensions and the rate per meter. This type of problem helps develop understanding of perimeter calculation, unit conversions, and cost estimation, which are essential skills in everyday planning and construction projects.

In this article, we will explore how to determine the cost of fencing a rectangular garden step-by-step, including the necessary formulas, calculations, and practical tips. Whether you are a student preparing for exams or a homeowner planning your garden, understanding these concepts will enable you to estimate fencing costs accurately.

Understanding the Problem

Before diving into calculations, it is important to understand the key components involved in this problem:

- **Dimensions of the garden:** Length and breadth (width).
- **Perimeter of the rectangle:** The total length of fencing needed.
- **Rate of fencing per meter:** Rs.7.5 per meter in this case.
- **Cost of fencing:** Total cost based on the perimeter and rate.

The primary goal is to find the total fencing cost, which involves calculating the perimeter of the garden and then multiplying it by the rate per meter.

Step-by-Step Calculation Process

To determine the fencing cost, follow these systematic steps:

1. Find the Perimeter of the Rectangular Garden

The perimeter (P) of a rectangle is given by the formula:

$$P = 2 \times (L + B)$$

where:

- L = length of the garden
- B = breadth of the garden

Ensure the measurements are in meters for consistency with the rate.

2. Calculate the Total Fencing Needed

Once you have the perimeter, this value directly represents the total length of fencing required in meters.

3. Determine the Total Cost of Fencing

Multiply the total fencing length by the rate per meter:

$$\text{Total Cost} = P \times \text{Rate per meter}$$

In this case, the rate is Rs.7.5 per meter.

Practical Example

Let's take a practical example to illustrate the process:

Suppose the length of the garden is 30 meters, and the breadth is 20 meters.

Step 1: Calculate the perimeter

$$P = 2 \times (L + B) = 2 \times (30 + 20) = 2 \times 50 = 100 \text{ meters}$$

Step 2: Determine total fencing needed

The fencing needed is equal to the perimeter, which is 100 meters.

Step 3: Calculate the total fencing cost

$$\begin{aligned} & \text{Total Cost} = 100 \times 7.5 = \text{Rs.}750 \end{aligned}$$

Hence, the cost of fencing the garden at Rs.7.5 per meter will be Rs.750.

Additional Considerations

While the above example provides a straightforward calculation, real-world scenarios may involve additional factors:

1. Adjusting for Gate Openings

If the garden has gates or openings, the total fencing length might be reduced, or additional costs might be involved for gate installation.

2. Material and Labor Costs

The rate of Rs.7.5 per meter could include only the fencing material, or it might also cover installation labor. Clarify what the rate includes before calculating.

3. Variations in Garden Dimensions

If only the dimensions are known, ensure they are accurately measured in meters. Convert from other units as necessary.

Additional Formulas and Tips

For different shapes or more complex garden designs, alternative formulas or approaches may be necessary.

Calculating Perimeter for Other Shapes

- **Square Garden:** Perimeter = $4 \times \text{side length}$

- **Irregular shapes:** Sum of all sides or use specific geometric formulas

Converting Units

If the measurements are in centimeters or feet, convert them to meters before performing calculations:

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\[
1 \text{ meter} = 100 \text{ centimeters}
\]
\[
1 \text{ foot} \approx 0.3048 \text{ meters}
\]
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Summary

Calculating the cost of fencing a rectangular garden involves a few simple steps:

1. Determine the length and breadth of the garden in meters.
2. Calculate the perimeter using $P = 2 \times (L + B)$.
3. Multiply the perimeter by the rate per meter (Rs.7.5) to find the total cost.

This method provides an accurate estimate for fencing costs and can be adapted for different garden sizes and rates.

Conclusion

Understanding how to find the cost of fencing a rectangular garden at Rs.7.5 per meter is a valuable skill that combines basic geometry with real-world application. By knowing the dimensions of your garden, calculating the perimeter, and multiplying by the rate per meter, you can easily estimate the expenses involved in fencing your outdoor space. Remember to measure accurately, account for additional features like gates, and clarify what the rate includes to ensure your calculations are precise.

Whether you are planning a new garden, upgrading existing fencing, or just

learning fundamental math concepts, mastering these calculations will help you make informed decisions and manage your budgets effectively.

Frequently Asked Questions

What is the formula to find the cost of fencing a rectangular garden?

The cost of fencing is calculated by multiplying the total perimeter of the garden by the rate per meter. $\text{Cost} = \text{Perimeter} \times \text{Rate per meter}$.

How do you find the perimeter of a rectangular garden?

$\text{Perimeter} = 2 \times (\text{Length} + \text{Breadth})$.

If the length and breadth of the garden are known, how can I calculate the fencing cost at Rs.7.5 per meter?

First, find the perimeter using $2 \times (\text{Length} + \text{Breadth})$, then multiply that by Rs.7.5 to get the total fencing cost.

Can you provide an example calculation for fencing cost if the garden's length is 20 meters and breadth is 10 meters?

Yes. $\text{Perimeter} = 2 \times (20 + 10) = 2 \times 30 = 60$ meters. $\text{Cost} = 60 \times 7.5 = \text{Rs. } 450$.

What if the length is 25 meters and the breadth is 15 meters, what is the fencing cost?

$\text{Perimeter} = 2 \times (25 + 15) = 2 \times 40 = 80$ meters. $\text{Cost} = 80 \times 7.5 = \text{Rs. } 600$.

Is the rate of Rs.7.5 per meter fixed for all fencing calculations?

No, the rate can vary depending on the fencing material and location, but in this problem, it is given as Rs.7.5 per meter.

How does changing the length and breadth affect the fencing cost?

Increasing either the length or breadth increases the perimeter, which in turn raises the fencing cost proportionally.

What is the importance of knowing the dimensions of the garden when calculating fencing costs?

Knowing the dimensions allows accurate calculation of the perimeter, which is essential for determining the total fencing cost at the given rate.

Additional Resources

Find The Cost Of Fencing A Rectangular Garden At The Rate Of Rs.7.5 Per M, If Its Length And Breadth is a common problem in basic geometry and practical mathematics, especially relevant for homeowners, gardeners, and students aiming to understand how to calculate fencing costs based on the dimensions of their land. This problem combines the fundamental concepts of perimeter calculation with real-world applications, emphasizing the importance of understanding measurements, units, and cost calculations. In this article, we will explore the steps involved in solving such a problem, analyze the concepts behind the calculations, and discuss practical considerations and tips for accurately determining fencing costs for a rectangular garden.

Understanding the Problem Statement

Before diving into calculations, it's essential to understand what the problem asks. The key points are:

- The shape of the garden is rectangular.
- The rate for fencing is Rs.7.5 per meter.
- The goal is to find the total cost of fencing, given the length and breadth of the garden.

Typically, such problems provide the dimensions (length and breadth), or require the user to determine these based on other data. In this case, the problem emphasizes the relationship between the dimensions, perimeter, and cost, which can be applied to a variety of similar problems.

Breaking Down the Concepts

1. Perimeter of a Rectangular Garden

The perimeter (P) of a rectangle is the total length of its boundary. For a rectangle with length (L) and breadth (B):

$$P = 2 \times (L + B)$$

This formula is fundamental in calculating how much fencing material is required.

2. Rate of Fencing

Given the rate per meter (Rs.7.5), once we know the total perimeter, we can multiply it to find the total fencing cost:

$$\text{Cost} = \text{Perimeter} \times \text{Rate per meter}$$

3. Calculating the Cost

The overall steps to compute the cost are:

- Find the perimeter using the dimensions.
- Multiply the perimeter by the rate per meter to get the total cost.

Step-by-Step Solution Approach

Suppose the length and breadth are provided or need to be deduced. The following steps outline the typical approach:

Step 1: Gather or determine the dimensions

- If dimensions are given, proceed directly with calculations.
- If not provided, use other data or assumptions as necessary.

Step 2: Calculate the perimeter

Using the formula:

$$P = 2 \times (L + B)$$

For example, if $L = 50$ meters and $B = 20$ meters:

$$P = 2 \times (50 + 20) = 2 \times 70 = 140 \text{ meters}$$

Step 3: Calculate the total fencing cost

Multiply the perimeter by Rs.7.5:

$$\text{Cost} = 140 \times 7.5 = \text{Rs.}1050$$

Thus, the fencing cost for such a garden would be Rs.1050.

Practical Example with Hypothetical Dimensions

Let's consider a hypothetical scenario where the length and breadth are not directly given but are related or need to be estimated.

Suppose the garden's length is 60 meters, and the breadth is 30 meters:

- Perimeter:

$$P = 2 \times (60 + 30) = 2 \times 90 = 180 \text{ meters}$$

- Total fencing cost:

$$\text{Rs.}7.5 \times 180 = \text{Rs.}1350$$

This straightforward calculation demonstrates how varying dimensions impact the overall cost.

Applications and Real-World Considerations

Understanding how to find the fencing cost based on dimensions and rates is valuable for:

- Planning garden or land fencing projects.
- Budget estimation for property development.
- Academic exercises in geometry and applied mathematics.

However, in real-world scenarios, additional factors should be considered:

- Fencing material wastage: Typically, an extra 5-10% of fencing length is added to account for wastage or errors.
- Type of fencing material: Different materials (wire, wood, metal) may have different costs and installation complexities.
- Accessibility and terrain: Uneven or difficult terrains may increase costs or require special fencing solutions.
- Labor charges: Installation costs may add to the raw material cost.

Additional Factors Affecting Fencing Cost

- Shape of the Garden: While the problem considers a rectangular shape, irregular shapes require different perimeter calculations.
- Fencing Height & Design: Decorative fencing or taller fences may increase costs.
- Environmental Regulations: Local rules may influence fencing type and height.

Pros and Cons of Fencing Based on Cost Calculations

Pros:

- Cost Prediction: Enables accurate budgeting before starting construction.
- Design Planning: Helps in optimizing garden dimensions for budget constraints.
- Material Estimation: Facilitates procurement planning by estimating needed fencing material.

Cons:

- Assumption-based: Relying solely on measurements can lead to inaccuracies if not accounting for wastage or terrain.
- Ignoring Installation Costs: Material costs don't include labor or installation fees.
- Dynamic Rates: Material costs may vary over time, affecting calculations.

Features of an Accurate Fencing Cost Calculation

- Precise measurement of dimensions.
- Inclusion of wastage and extra material.
- Consideration of material and labor costs.
- Awareness of local regulations and environmental factors.
- Flexibility to adapt calculations based on changing rates or conditions.

Conclusion

Finding the cost of fencing a rectangular garden at Rs.7.5 per meter involves fundamental geometric calculations combined with practical considerations of material costs and project planning. By understanding the relationship between dimensions, perimeter, and cost, homeowners and students can accurately estimate expenses and plan their fencing projects effectively. While straightforward in theory, real-world applications require attention to detail, allowances for wastage, and consideration of additional costs such as installation and material variations. Ultimately, mastering these calculations not only enhances mathematical skills but also empowers effective resource management for garden and property fencing projects.

In summary:

- Determine the dimensions of the garden.
- Calculate the perimeter using $P = 2(L + B)$.
- Multiply the perimeter by Rs.7.5 to find the total fencing cost.
- Incorporate additional factors for a realistic budget estimate.
- Use this understanding for planning, budgeting, and executing fencing projects efficiently.

This comprehensive approach ensures a clear grasp of the concepts involved, practical application, and readiness to tackle similar problems confidently.

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Of Rs 7 5 Per M If Its Length And Breadth

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