

Help Please. Set Up A Proportion To Convert 90 Inches Into Feet. (Hint: There Are 12 Inches In A Foot) .

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Converting inches to feet is a common task in measurement, especially when dealing with height, length, or construction projects. When you need to convert 90 inches into feet, understanding how to set up a proportion simplifies the process and ensures accuracy. This article will guide you step-by-step through setting up the proportion, explain the underlying concepts, and provide practice examples to solidify your understanding.

Understanding the Basics of Conversion

Before diving into the proportion setup, it's important to understand the basic units involved in the conversion process.

What Are Inches and Feet?

- Inches (in) and feet (ft) are units of length measurement used primarily in the United States customary system.
- There are 12 inches in one foot, which is a standard conversion factor.

The Importance of Conversion

Converting inches to feet is essential in various contexts, such as:

- Measuring the height of a person or object.
- Planning for construction or interior design.
- Calculating areas or volumes that require consistent units.

Setting Up the Proportion for Conversion

The key to converting inches to feet is to establish a proportion based on the known conversion factor: 12 inches = 1 foot.

Step 1: Write the Known Conversion

Start by writing the known relationship:

- 12 inches = 1 foot

Step 2: Define the Unknown

Let's denote the number of feet equivalent to 90 inches as 'x'.

- So, the unknown we want to find is x (feet).

Step 3: Set Up the Proportion

Using the known relationship, set up a proportion:

$$\frac{\text{Inches}}{\text{Feet}} = \frac{\text{Known Inches}}{\text{Known Feet}}$$

For this specific case:

$$\frac{90 \text{ inches}}{x \text{ feet}} = \frac{12 \text{ inches}}{1 \text{ foot}}$$

Step 4: Solve the Proportion

Cross-multiplied, the proportion becomes:

$$90 \times 1 = 12 \times x$$

$$90 = 12x$$

Now, solve for x:

$$x = \frac{90}{12}$$

Calculating the Conversion

Performing the division:

$$x = \frac{90}{12} = 7.5$$

Therefore, 90 inches is equal to 7.5 feet.

Practical Applications of the Conversion

Knowing how to set up and solve such proportions is useful in many real-world scenarios.

Example 1: Height Measurements

If a person is 90 inches tall, their height in feet is 7.5 feet. This is particularly useful for understanding height in more familiar units.

Example 2: Construction and Carpentry

When measuring materials or spaces, converting inches to feet helps in planning and estimating costs or dimensions.

Example 3: Interior Design

Determining the height of furniture or space in feet makes it easier to visualize and plan layouts.

Additional Tips for Converting Measurements

To make conversions easier and more accurate, consider the following tips:

- Always identify the known and unknown quantities clearly.

- Use the known conversion factor as a ratio to set up the proportion.
- Perform cross-multiplication carefully to avoid errors.
- Use a calculator for division to ensure precision, especially with larger numbers.
- Practice with different values to strengthen your understanding of proportions and conversions.

Practice Problems for Mastery

Try setting up and solving these similar problems to reinforce your skills:

1. Convert 144 inches into feet.
2. If a board measures 60 inches, how many feet long is it?
3. A tall tree is 180 inches high. What is its height in feet?
4. Convert 30 inches into feet.
5. An object is 240 inches in length. How many feet long is it?

Solutions:

- 144 inches: $\left(\frac{144}{12} = 12 \right)$ feet
- 60 inches: $\left(\frac{60}{12} = 5 \right)$ feet
- 180 inches: $\left(\frac{180}{12} = 15 \right)$ feet
- 30 inches: $\left(\frac{30}{12} = 2.5 \right)$ feet
- 240 inches: $\left(\frac{240}{12} = 20 \right)$ feet

Conclusion

Converting inches to feet is a straightforward process that hinges on understanding the relationship between the units and setting up an appropriate proportion. By recognizing that 12 inches equal 1 foot, you can quickly translate any measurement in inches to its equivalent in feet. Remember to set up your proportion carefully, perform the cross-multiplication accurately, and always double-check your calculations. Mastering this technique will make your measurements more precise and your projects more successful.

Whether you're measuring for construction, design, or everyday needs, understanding how to set up and solve proportions ensures you can convert measurements confidently and efficiently.

Frequently Asked Questions

How do I set up a proportion to convert 90 inches into feet?

You set up the proportion as $90 \text{ inches} / x \text{ feet} = 12 \text{ inches} / 1 \text{ foot}$, then solve for x to find the number of feet.

What is the first step in converting 90 inches to feet using a proportion?

Write the proportion: $90 / x = 12 / 1$, then cross-multiply to solve for x .

How do I solve the proportion to find the number of feet in 90 inches?

Cross-multiply: $90 \cdot 1 = 12 \cdot x$, then divide both sides by 12: $x = 90 / 12$.

What is the result when I divide 90 by 12 to convert inches to feet?

Dividing 90 by 12 gives 7.5, so 90 inches equals 7.5 feet.

Why is it necessary to use a proportion to convert inches to feet?

Using a proportion helps ensure an accurate conversion based on the known relationship that 12 inches equal 1 foot.

Can I use a simple division instead of a proportion to convert inches to feet?

Yes, dividing the number of inches by 12 directly converts inches to feet; setting up a proportion is just a systematic way to understand and verify the conversion.

What is the final answer when converting 90 inches into feet?

90 inches is equal to 7.5 feet.

Additional Resources

Help Please. Set Up A Proportion To Convert 90 Inches Into Feet. (Hint: There Are 12 Inches In A Foot).

Converting measurements from inches to feet is a fundamental skill in mathematics, especially in contexts involving real-world measurements such as construction, interior design, or even everyday tasks like measuring furniture or spaces. When you encounter the phrase "Help please," it indicates a need for clear, step-by-step guidance. In this article, we will explore how to set up a proportion to convert 90 inches into feet, emphasizing the importance of understanding ratios and proportions. We will

also delve into the underlying concepts, methods, and problem-solving strategies that make such conversions straightforward and reliable.

Understanding the Basics of Measurement Conversion

Before diving into setting up proportions, it is crucial to understand what measurement conversion entails. Conversion between units involves expressing a quantity in different units that measure the same thing, such as inches and feet. Since these units are related through a fixed ratio, conversion can be performed efficiently using proportions.

In this specific case, the key information provided is that there are 12 inches in a foot. This ratio acts as the foundation for establishing a proportion to convert inches to feet.

Why Use Proportions for Conversion?

Proportions are equations that state two ratios are equivalent. They are extremely useful for converting units because they allow us to set up a relationship between known and unknown quantities.

Advantages of using proportions include:

- **Simplicity:** They offer a straightforward approach to unit conversions.
- **Flexibility:** They can be used for various conversions beyond inches and feet.
- **Accuracy:** Properly set up proportions ensure precise results.

Disadvantages:

- **Requires understanding of ratios:** If you're unfamiliar with ratios, setting up proportions may be confusing.
- **Potential for errors:** Mistyping numbers or mixing units can lead to incorrect answers.

Step-by-Step Guide to Setting Up the Proportion

Let's walk through the process of converting 90 inches into feet by setting up a proportion.

Step 1: Identify the known and unknown quantities

- **Known:** 90 inches (the measurement we want to convert).
- **Unknown:** the equivalent measurement in feet.

Step 2: Write the known ratio

Because there are 12 inches in 1 foot, the ratio can be written as:

$$\left[\frac{12 \text{ inches}}{1 \text{ foot}} \right]$$

This ratio represents the relationship between inches and feet.

Step 3: Set up the proportion

Let (x) be the number of feet equivalent to 90 inches. Set up the proportion:

$$\left[\frac{\text{Inches}}{\text{Feet}} = \frac{\text{Known Inches}}{\text{Unknown Feet}} \right]$$

Plugging in the known values:

$$\left[\frac{12}{1} = \frac{90}{x} \right]$$

This proportion states that 12 inches is to 1 foot as 90 inches is to (x) feet.

Step 4: Cross-multiply and solve for (x)

Cross-multiplied, the equation becomes:

$$\left[12 \times x = 1 \times 90 \right]$$

$$\left[12x = 90 \right]$$

Divide both sides by 12:

$$\left[x = \frac{90}{12} \right]$$

$$\left[x = 7.5 \right]$$

Result: 90 inches is equivalent to 7.5 feet.

Alternative Methods for Conversion

While setting up a proportion is a classic and effective method, there are other ways to perform the same conversion, which can be useful depending on context and preference.

Method 1: Direct Division

Since 1 foot equals 12 inches, converting inches to feet involves dividing the total inches by 12:

$$\left[\text{Feet} = \frac{\text{Inches}}{12} \right]$$

Applying this:

$$\left[\text{Feet} = \frac{90}{12} = 7.5 \right]$$

This method is quick and straightforward, especially when dealing with simple conversions.

Method 2: Using Conversion Factors

You can multiply the measurement by a conversion factor:

$$\left[1 \text{ foot} = 12 \text{ inches} \rightarrow 1 \text{ inch} = \frac{1}{12} \text{ foot} \right]$$

Thus,

$$\left[90 \text{ inches} \times \frac{1}{12} = 7.5 \text{ feet} \right]$$

This approach is particularly useful when working with multiple conversions or when integrating into algebraic expressions.

Common Mistakes to Avoid

- Mixing units: Ensure that units are consistent before setting up the proportion. For example, don't accidentally set up the proportion with inches and feet in the wrong positions.
- Incorrect ratio: Remember that the ratio should reflect the known relationship (12 inches in 1 foot). Swapping numerator and denominator can lead to errors.
- Arithmetic errors: Be careful with division, especially when dealing with larger numbers or decimals.

Practical Applications of Conversion Skills

Understanding how to set up and solve proportions for measurement conversions has numerous real-world applications:

- Construction and carpentry: Converting measurements from plans (often in inches) to actual building components (in feet or meters).
- Interior design: Determining furniture placement or room dimensions.
- Education: Building foundational skills in math and measurement.
- Science and engineering: Precise measurements often require unit conversions.

Features and Benefits of Using Proportions for Conversion

- Versatility: The same approach can be used for different units, such as miles to kilometers, ounces to grams, or hours to minutes.
- Educational value: Enhances understanding of ratios, fractions, and algebra.
- Accuracy: When set up correctly, proportions provide exact results.

Summary and Final Thoughts

Converting 90 inches into feet is a fundamental math skill that demonstrates the power of ratios and proportions. By recognizing the known relationship—12 inches in a foot—and setting up the appropriate proportion, we can effortlessly determine that 90 inches equals 7.5 feet. Whether you prefer to use proportions, direct division, or conversion factors, the key is to understand the underlying relationship and ensure consistency in units.

Mastering these techniques not only helps in academic settings but also prepares you for practical tasks in everyday life and various professional fields. With practice, setting up and solving such proportions becomes second nature, making measurement conversions quick, accurate, and reliable.

In conclusion, understanding how to set up a proportion to convert inches to feet is a vital mathematical skill. It empowers you to handle various measurement problems confidently and accurately, making it an essential component of quantitative literacy.

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