

One More Than Six Times That Number Is 37. Select The Solution And Graph That Represents The Original

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Understanding and solving algebraic equations is fundamental to developing problem-solving skills in mathematics. The phrase "One more than six times that number is 37" describes a simple algebraic problem that involves translating words into a mathematical equation, solving for the unknown, and then visualizing the solution through a graph. This article provides a detailed step-by-step explanation of how to approach such problems, including identifying the variables, formulating the equation, solving it, and representing the solution graphically.

Breaking Down the Problem Statement

Before delving into the solution, it's essential to understand the problem statement clearly:

- "One more than six times that number" refers to an algebraic expression.
- The phrase "is 37" indicates the total or the result of the expression.

The key is to translate this verbal description into a mathematical equation that can be solved systematically.

Translating Words into an Algebraic Equation

Identifying the Variable

The first step is to assign a variable to the unknown quantity, which is "that number." Let's denote:

- x = the unknown number

Constructing the Equation

The phrase "six times that number" translates to:

- $6x$

"One more than six times that number" becomes:

- $6x + 1$

The statement "is 37" indicates equality, leading to:

- $6x + 1 = 37$

This is the algebraic equation that represents the original problem.

Solving the Equation

Step-by-Step Solution

1. Start with the equation:

$$6x + 1 = 37$$

2. Subtract 1 from both sides to isolate the term with x:

$$6x = 37 - 1$$

$$6x = 36$$

3. Divide both sides by 6 to solve for x:

$$x = 36 / 6$$

$$x = 6$$

Therefore, the unknown number is 6.

Verifying the Solution

Always verify your solution by substituting the value back into the original verbal statement:

- "One more than six times that number" becomes:

$$6 \cdot 6 + 1 = 36 + 1 = 37$$

- Since this matches the given total, the solution is correct.

Graphical Representation of the Solution

Visualizing the solution helps in understanding the problem better. The graph

of the equation $6x + 1 = 37$ can be represented as a straight line, and the specific solution point can be highlighted.

Graphing the Equation

- The equation $6x + 1 = 37$ can be rearranged into the form $y = 6x + 1$.
- When plotting on a coordinate plane, y represents the expression, and the line shows all points satisfying the equation.

However, since the original problem states that the expression equals 37, we are interested in the point where $6x + 1$ equals 37, which is a specific point on the line $y = 6x + 1$ where $y = 37$.

Steps to graph the solution:

1. Plot the line $y = 6x + 1$ across a suitable range of x -values.
2. Draw a horizontal line $y = 37$.
3. The intersection point of these two lines corresponds to the solution $x = 6$.

This intersection point:

- Has coordinates $(6, 37)$.
- Represents the original number $x = 6$.

Practical Applications of Solving Similar Equations

Understanding how to solve equations like $6x + 1 = 37$ has numerous real-world applications, including:

- Financial calculations, such as determining the principal or interest.
- Engineering tasks involving measurements and design.
- Business analytics for profit or cost estimations.
- Scientific experiments requiring data modeling.

By mastering these problem-solving techniques, students can confidently analyze and interpret various quantitative data.

Additional Practice Problems

To solidify understanding, consider practicing with similar problems:

1. One more than three times a number is 16. Find the number and graph the solution.
2. Five less than twice a number equals 9. Determine the number and

illustrate it on a graph.

3. Seven more than four times a number is 33. Solve for the number and plot the solution.

Summary and Key Takeaways

- The phrase "One more than six times that number is 37" translates to the equation $6x + 1 = 37$.
- Solving the equation yields $x = 6$.
- The solution can be verified by substitution into the original statement.
- Graphically, the solution corresponds to the point (6, 37) on the coordinate plane.
- Visualizing the equation and its solution enhances understanding and provides insight into the relationship between algebraic expressions and their graphical representations.

Conclusion

Mastering the translation of word problems into algebraic equations, solving for the unknown, and representing solutions graphically are essential skills in mathematics. The problem "One more than six times that number is 37" exemplifies these skills and offers a foundation for tackling more complex algebraic problems. By following systematic steps—identification, formulation, solution, verification, and visualization—students and learners can develop confidence and competence in algebra and its applications.

Additional Resources for Learning Algebra

- Online algebra tutorials and videos
- Interactive graphing tools like Desmos or GeoGebra
- Practice worksheets with varying difficulty levels
- Math tutoring and study groups

Engaging with these resources can further enhance understanding and mastery of algebraic concepts.

Remember: Mathematical problems like this are not only about finding the right answer but also about understanding the process and reasoning involved. Practice regularly to develop a strong foundation in algebraic thinking.

Frequently Asked Questions

What is the algebraic equation representing 'One more than six times a number is 37'?

The equation is $6x + 1 = 37$.

How do you solve for the number in the equation $6x + 1 = 37$?

Subtract 1 from both sides to get $6x = 36$, then divide both sides by 6 to find $x = 6$.

What is the value of the number when 'One more than six times that number is 37'?

The number is 6.

Which graph correctly represents the equation $6x + 1 = 37$?

The graph that shows a linear equation with a slope of 6 and y-intercept at 1, intersecting the line at $x = 6$.

How can you verify the solution $x = 6$ for the equation $6x + 1 = 37$?

Substitute $x = 6$ into the equation: $6(6) + 1 = 36 + 1 = 37$, which confirms the solution is correct.

What is the importance of selecting the correct graph for this linear equation?

Choosing the correct graph visually confirms the solution and helps understand the relationship between the variables.

Can this problem be represented with a different type of graph other than a linear graph?

No, because the equation is linear; only a linear graph accurately represents it.

What steps should you follow to graph the equation $6x + 1 = 37$?

Rewrite the equation in slope-intercept form ($y = 6x + 1$), then plot the point (6, 37) and draw a line through it with slope 6.

Additional Resources

One More Than Six Times That Number Is 37. Select The Solution And Graph That Represents The Original

The phrase "One More Than Six Times That Number Is 37" presents an intriguing algebraic problem that invites both mathematical reasoning and visual representation. At its core, this statement is a straightforward linear equation that requires solving for an unknown variable, often represented by a letter such as x . Once the solution is obtained, the next step involves understanding how this solution can be visualized through graphs, providing a concrete representation of the abstract algebraic relationship. This article explores the problem's formulation, solution process, and the graphical depiction that best represents the original statement, offering an in-depth look for students, educators, and math enthusiasts alike.

Understanding the Problem Statement

Breaking Down the Phrase

The phrase "One more than six times that number is 37" can be translated into an algebraic equation. Let's identify the key components:

- "That number" refers to an unknown quantity, typically represented as x .
- "Six times that number" becomes $6x$.
- "One more than six times that number" translates to $6x + 1$.
- The phrase "is 37" indicates equality, leading to the equation $6x + 1 = 37$.

This simple sentence is a classic example of how natural language can be converted into a mathematical equation, showcasing the importance of language skills in mathematical problem-solving.

The Algebraic Equation

The resulting algebraic equation from the statement is:

$$\text{\textbackslash[} 6x + 1 = 37 \text{ \textbackslash]}$$

Our goal is to solve for x , which will give us the value of the original number.

Solving the Equation

Step-by-Step Solution

1. Isolate the term containing x :

$$6x + 1 = 37$$

Subtract 1 from both sides:

$$6x = 37 - 1$$

$$6x = 36$$

2. Solve for x :

Divide both sides by 6:

$$x = \frac{36}{6}$$

$$x = 6$$

Result: The original number is 6.

Verification of the Solution

To ensure the correctness of the solution, substitute $x = 6$ back into the original statement:

- Calculate six times x :

$$6 \times 6 = 36$$

- Add 1:

$$36 + 1 = 37$$

- Since this matches the right side of the equation, the solution $x = 6$ is verified.

Representing the Original Equation Graphically

Visualizing the algebraic equation through a graph helps in understanding the

relationship between the variables and provides an intuitive grasp of the solution.

Graph of the Linear Equation

The equation:

$$\begin{aligned} & \backslash[\\ & 6x + 1 = 37 \\ & \backslash] \end{aligned}$$

can be transformed into the standard form for graphing:

$$\begin{aligned} & \backslash[\\ & y = 6x + 1 \\ & \backslash] \end{aligned}$$

where y is a dependent variable. To visualize the solution, we can plot the line:

$$\begin{aligned} & \backslash[\\ & y = 6x + 1 \\ & \backslash] \end{aligned}$$

and identify the point where y equals 37.

Alternative approach: Plot the line $y = 6x + 1$ and draw a horizontal line $y = 37$; the intersection point corresponds to the solution.

Graph Components and Features

- Line 1: $y = 6x + 1$ (a straight line with slope 6 and y -intercept at 1)
- Line 2: $y = 37$ (a horizontal line crossing the y -axis at 37)

The intersection point of these lines indicates the x value that satisfies the original equation.

Calculating the Intersection Point

Set y equal to 37 in the first equation:

$$\begin{aligned} & \backslash[\\ & 37 = 6x + 1 \\ & \backslash] \end{aligned}$$

Subtract 1:

$$\begin{aligned} & \backslash[\\ & 36 = 6x \\ & \backslash] \end{aligned}$$

Divide:

```
\[
x = 6
\]
```

The point of intersection is at:

```
\[
(6, 37)
\]
```

This point visually confirms our algebraic solution.

Graph Selection and Interpretation

Choosing the Correct Graph

For the problem at hand, the most effective graph is a coordinate plane featuring:

- The straight line $y = 6x + 1$
- The horizontal line $y = 37$

The intersection point, $(6, 37)$, visually demonstrates the solution to the equation.

Features of the graph:

- Provides a visual confirmation of the algebraic solution.
- Highlights the slope and intercepts.
- Facilitates understanding of how changing the variable x affects the value of y .

Features and Pros of the Graph

- **Clarity:** Clearly shows the relationship between x and y .
- **Intuitive:** The intersection point makes the solution accessible without algebra.
- **Educational:** Useful for visual learners to connect algebraic and geometric perspectives.

Limitations:

- Only suitable for simple linear equations.
- Requires graphing tools or software for precise intersections.

Alternative Graphs and Visualizations

- **Number Line Representation:** Marking that $x=6$ satisfies the equation.
- **Bar Graphs or Pie Charts:** Less relevant but can be used for contextual

understanding.

- Dynamic Graphing Tools: Interactive platforms like Desmos or GeoGebra can enhance understanding.

Conclusion and Final Thoughts

The problem "One more than six times that number is 37" is a classic example of translating natural language into an algebraic equation, solving that equation, and then visualizing it through a graph. The algebraic solution $x = 6$ is straightforward, but its significance is amplified when represented graphically. The intersection point of $y = 6x + 1$ and $y = 37$ provides a visual affirmation of the solution, bridging the gap between abstract algebra and concrete visualization.

This exercise underscores several key features of mathematical problem-solving:

- The importance of translating verbal statements into equations.
- The power of algebraic manipulation to find precise solutions.
- The value of graphical representation to enhance understanding and verification.

In summary:

- The solution to the equation is $x = 6$.
- The most representative graph features the line $y = 6x + 1$ and the horizontal line $y = 37$.
- The intersection point at $(6, 37)$ visually confirms the solution.

Through this comprehensive exploration, learners can appreciate the interconnectedness of language, algebra, and graphing, enriching their mathematical toolkit for future challenges.

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