If Function G Has The Factors (x-7) And (x + 6), What Are The Zeros Of Function G?A7 And 66 And 76 And

If Function G Has The Factors (x-7) And (x + 6), What Are The Zeros Of Function G?A7 And 66 And 76 And

When exploring the properties of polynomial functions, understanding their factors and zeros is essential. If you are given that Function G has the factors (x - 7) and (x + 6), you might wonder what the zeros of the function are, and how they relate to these factors. Additionally, the question seems to include some numbers like A7, 66, 76, which could be points of confusion or perhaps typographical errors. This article aims to clarify how to find the zeros of function G based on its factors, interpret the meaning of these zeros, and explain their significance in algebraic contexts.

Understanding Factors and Zeros of Polynomial Functions

What Are Factors in Polynomial Functions?

Factors of a polynomial are expressions that, when multiplied together, produce the polynomial. In the context of polynomial functions, factors are closely related to the zeros or roots of the function.

For example, if a polynomial has a factor (x - a), then x = a is a zero of the polynomial. Conversely, zeros of the polynomial correspond to the roots where the function equals zero.

Relationship Between Factors and Zeros

- Factors are the polynomials that divide the function evenly.
- Zeros (or roots) are the values of x where the function evaluates to zero.
- The Zero Theorem states that if (x - a) is a factor of the polynomial, then the zero is at x = a.

Determining Zeros of Function G from Its Factors

Given that Function G has the factors (x - 7) and (x + 6), we can determine its zeros directly.

Step-by-Step Process

1. Identify the factors: (x - 7) and (x + 6).
2. Set each factor equal to zero:
- x - 7 = 0 □ x = 7
- x + 6 = 0 □ x = -6
3. Conclude the zeros: The zeros of function G are at x = 7 and x = -6.

Constructing the Polynomial Function G

Knowing the factors, we can write the general form of the polynomial:

\[
G(x) = k \times (x - 7) \times (x + 6)

\]

where k is a constant coefficient, which can be any real number depending on the specific function.

Standard Form of Function G

Expanding the factors:

\[
G(x) = k \times (x^2 + 6x - 7x - 42) = k \times (x^2 - x - 42)
\]

If the leading coefficient is not specified, the most common choice is k = 1 for simplicity:

\[
G(x) = x^2 - x - 42
\]

The zeros remain at x = 7 and x = -6, regardless of the value of k, as these are the roots where G(x) = 0.

Interpreting The Mentioned Numbers: 66, 76, and A7

The original question mentions "A7," "66," and "76," which might seem out of context. Let's clarify what these could represent:

Possible Interpretations

- A7: Likely a typo or misprint. It could be intended as "97" or another number.
- 66 and 76: These are numbers, but they do not directly relate to the zeros derived from the factors unless they are points on the graph or specific values to evaluate.

Zeros Correspondence with 66 and 76

- The zeros of the function G are at $x = 7$ and $x = -6$.
- The numbers 66 and 76 are not zeros unless the function is evaluated at those points, which would not result in zero in typical polynomial functions.

How to Find Zeros for Any Polynomial Function

If you are given a polynomial function and need to determine its zeros, follow these steps:

Method 1: Factoring

- Factor the polynomial completely.
- Set each factor equal to zero.
- Solve for x.

Method 2: Using Polynomial Division

- Use synthetic or long division to factor higher-degree polynomials if possible.
- Reduce the polynomial step by step.

Method 3: Applying the Rational Root Theorem

- Use this theorem to find potential rational roots.
- Test these roots by substitution.

Method 4: Graphical Methods

- Plot the polynomial.
- Observe where it crosses the x-axis; these points are the zeros.

Examples of Finding Zeros from Factors

Example 1:

Given the factors (x - 3) and (x + 2) for a polynomial G(x):

- Zeros are at x = 3 and x = -2.

Example 2:

If G(x) = 2(x - 4)(x + 1), then:

- Zeros are at x = 4 and x = -1.

Summary: Key Takeaways

- The factors of a polynomial directly determine its zeros.
- For Function G with factors (x - 7) and (x + 6), the zeros are x = 7 and x = -6.
- The zeros are the x-values where the function equals zero, corresponding to the roots of the polynomial.
- The numbers 66, 76, and A7 in the question likely do not relate directly to the zeros unless additional context is provided.
- Understanding the relationship between factors and zeros simplifies the process of analyzing polynomial functions.

Conclusion

In conclusion, when given the factors of a polynomial, you can easily determine its zeros by setting each factor equal to zero and solving for x. For Function G, with factors (x - 7) and (x + 6), the zeros are straightforwardly x = 7 and x = -6. Recognizing these zeros helps in graphing the function, solving equations, and understanding the behavior of polynomial functions. Remember, the process of factoring and solving is fundamental in algebra and forms the basis for more advanced topics in calculus and polynomial analysis.

If you have any more questions about polynomial functions, zeros, or factoring techniques, consult your algebra textbook or seek guidance from a math instructor to deepen your understanding.

Frequently Asked Questions

What are the zeros of the function G if its factors are (x – 7) and (x +

6)?

The zeros of the function G are x = 7 and x = -6.

How do factors of a function relate to its zeros?

Factors of a function are expressions that, when set equal to zero, give the zeros (roots) of the function.

If G(x) has factors (x - 7) and (x + 6), what is the general form of G(x)?

G(x) can be written as a multiple of (x - 7)(x + 6).

Are the zeros of G the same as the roots of its factors?

Yes, the zeros of G are the values of x that make each factor zero, which are x = 7 and x = -6.

What is the significance of the factors (x - 7) and (x + 6) in determining zeros?

They directly indicate the zeros of the function; (x - 7) zeroes at x = 7, and (x + 6) zeroes at x = -6.

Given the zeros x = 7 and x = -6, what are the corresponding factors of G?

The factors are (x - 7) and (x + 6).

Can the zeros of G be 7 and -6, or 66 and 76 as mentioned?

The zeros are 7 and -6; 66 and 76 are not zeros derived from the given factors.

How do you verify the zeros of a function given its factors?

Substitute the zeros into the function; if the function evaluates to zero, they are zeros of the function.

What is the importance of identifying zeros in a polynomial function?

Zeros help understand the graph's x-intercepts and the behavior of the polynomial.

Additional Resources

Factorization

Understanding the factors of a polynomial function is fundamental in algebra, especially when determining its zeros or roots. When analyzing a function $G(x)$, discovering its factors often provides direct insight into where the function intersects the x-axis, revealing its zeros. In this article, we will explore a specific case: if the function $G(x)$ has the factors $(x - 7)$ and $(x + 6)$, what are its zeros? We will also clarify the confusion surrounding the numerical options presented, such as 66, 76, and 7, 66, 76, to ensure a thorough understanding.

Understanding Polynomial Factors and Zeros

What Are Factors of a Polynomial?

In algebra, a factor of a polynomial is an expression that divides the polynomial exactly, leaving no remainder. If a polynomial $G(x)$ can be written as:

$$ G(x) = (x - a) \times Q(x) $$

where $Q(x)$ is another polynomial, then $(x - a)$ is a factor of $G(x)$. The importance of factors stems from the Fundamental Theorem of Algebra, which states that every non-zero polynomial of degree n has exactly n roots in the complex plane (counting multiplicities). Factors like $(x - a)$ directly relate to the zeros of the polynomial because:

$$ G(a) = 0 $$

whenever $(x - a)$ is a factor.

Key Point:
- Factors are linear expressions that, when multiplied together, produce the original polynomial.
- The zeros of the polynomial are the values of x for which $G(x) = 0$, which correspond to the roots associated with each factor.

From Factors to Zeros

Given the factors $(x - 7)$ and $(x + 6)$, the zeros are the solutions to:

$$ x - 7 = 0 \Rightarrow x = 7 $$
$$ x + 6 = 0 \Rightarrow x = -6 $$

This straightforward relationship shows that the zeros of $G(x)$ are 7 and -6.

Detailed Analysis of the Given Factors

Identifying the Zeros from the Factors $(x - 7)$ and $(x + 6)$

Since the factors are linear, their zeros are found by setting each factor equal to zero:

- For $(x - 7)$:

$$x - 7 = 0 \Rightarrow x = 7$$

- For $(x + 6)$:

$$x + 6 = 0 \Rightarrow x = -6$$

Therefore, the zeros of the polynomial $G(x)$ are at:

- $x = 7$
- $x = -6$

These zeros are the points where the graph of $G(x)$ intersects the x-axis.

Interpreting the Given Numerical Options

The question mentions options such as 7 and 66, 66 and 76, and possibly other combinations like 7, 66, and 76. Let's clarify these options in the context of zeros:

- 7: As established, this is a zero derived from $(x - 7)$.

- 66 and 76: These are larger numbers, not related directly to the factors provided unless the polynomial has additional factors not specified.

Important Clarification:

- The zeros are 7 and -6 based solely on the factors $(x - 7)$ and $(x + 6)$.
- The numbers 66 and 76 do not emerge from the given factors unless there's additional information or context suggesting different factors or roots.

Expanding the Polynomial (Optional Insight)

To better understand the nature of $G(x)$, consider constructing the polynomial from its factors:

$$G(x) = (x - 7)(x + 6)$$

Expanding:

$$
\begin{aligned}
G(x) &= x \times x + x \times 6 - 7 \times x - 7 \times 6 \\
&= x^2 + 6x - 7x - 42 \\
&= x^2 - x - 42
\end{aligned}
$$

Result:

$$ G(x) = x^2 - x - 42 $$

This quadratic polynomial has zeros at $x = 7$ and $x = -6$, confirming our earlier deductions.

Verifying the Zeros with the Quadratic Formula

Suppose we want to verify the zeros independently. Using the quadratic formula:

$$
x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}
$$

for the quadratic $G(x) = x^2 - x - 42$, where:

- $a = 1$
- $b = -1$
- $c = -42$

Calculating discriminant:

$$
\Delta = (-1)^2 - 4 \times 1 \times (-42) = 1 + 168 = 169
$$

Square root:

$$
\sqrt{\Delta} = \sqrt{169} = 13
$$

\]

Finding zeros:

\[
x = \frac{-(-1) \pm 13}{2} = \frac{1 \pm 13}{2}
\]

- \(x = \frac{1 + 13}{2} = \frac{14}{2} = 7 \)
- \(x = \frac{1 - 13}{2} = \frac{-12}{2} = -6 \)

This confirms the zeros are 7 and -6.

Summary and Final Clarification

Key Takeaways:

- The factors \((x - 7) \) and \((x + 6) \) immediately indicate the zeros of the polynomial are 7 and -6.
- The zeros are the solutions to the equations derived from each factor set to zero.
- The numerical options 66 and 76 are unrelated to these factors unless additional factors or roots are introduced.

Conclusion:

- The zeros of \(G(x) \), given its factors \((x - 7) \) and \((x + 6) \), are:

\[
\boxed{

$$x = 7 \quad \text{and} \quad x = -6$$

$$\}$$

$$\]$$

- The options such as 66 and 76 are not zeros of $G(x)$ based on the provided factors.

Final Thoughts: Applying the Knowledge

Understanding how factors relate to zeros is a vital skill in algebra. By recognizing factors, you can quickly determine the zeros without complex calculations. Moreover, expanding the factors into the polynomial helps verify the roots via the quadratic formula or other methods. Whether you're solving quadratic equations or analyzing polynomial functions, this foundational knowledge is essential for advanced mathematical problem-solving.

In essence, when given factors like $(x - a)$, the roots are simply a. For the factors $(x - 7)$ and $(x + 6)$, the zeros are 7 and -6 — a straightforward yet powerful concept in algebra.

If Function G Has The Factors X 7 And X 6 What Are The Zeros Of Function G A7 And 66 And 76 And

If Function G Has The Factors X 7 And X 6 What Are The Zeros Of Function G A7 And 66 And 76 And

Related Articles

- HELPPPP!!!!!!!!!!!!! ONLY IF YOU KNOW THE ANSWER!!! PLEAS I NEED THIS ASAP!!!!!!By Now, You Should Be
- If All 315 Registered Fishermen Were To Be Employed By Hotels (in Addition To The 2,446 People Already
- Irish And Irvin Are Partners With Capital Of P240,000 And P120,000 Respectively. They Share Profits In

Back to Home