Algebra II - Chapter 5 Test

Student: Alex Johnson

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Class: Algebra II - Period 3

Problem 1: Solve the quadratic equation

Question: Solve for x: `2x² + 5x - 3 = 0`

Solution:

Using the quadratic formula: `x = (-b ± √(b² - 4ac)) / 2a`

Where a = 2, b = 5, c = -3

`x = (-5 ± √(25 + 24)) / 4`

`x = (-5 ± √49) / 4`

`x = (-5 ± 7) / 4`

Therefore: `x₁ = 2/4 = 1/2` and `x₂ = -12/4 = -3`

Problem 2: Factor the polynomial

Question: Factor: $x^2 - 9x + 20$

Solution:

Looking for two numbers that multiply to 20 and add to -9

$-4 \times -5 = 20$ and $-4 + (-5) = -9$

Therefore: $x^2 - 9x + 20 = (x - 4)(x - 5)$

Check: $(x - 4)(x - 5) = x^2 - 5x - 4x + 20 = x^2 - 9x + 20$ ✓

Problem 3: Complete the square

Question: Complete the square for: $x^2 + 6x + 5$

Solution:

Step 1: `x² + 6x + 5`

Step 2: Take half of the coefficient of x, square it: `(6/2)² = 9`

Step 3: Add and subtract this value: `x² + 6x + 9 - 9 + 5`

Step 4: Group the perfect square: `(x + 3)² - 4`

Answer: `(x + 3)² - 4`

Problem 4: Graph interpretation

Question: What is the vertex of the parabola `y = x² - 4x + 3` ?

Solution:

Method 1 - Complete the square:

`y = x² - 4x + 3`

`y = x² - 4x + 4 - 4 + 3`

`y = (x - 2)² - 1`

Vertex: (2, -1)

End of Test - Good Luck!

This is a sample assignment for testing the AI Grading Platform