Topic 2.3: Factored Form of a Quadratic Function

Essential Question:

How is the factored form helpful in solving quadratic equations?

CONCEPT: Zero Product Property

$$If\ a * b = 0, then\ a = 0\ or\ b = 0$$

CONCEPT SUMMARY

Factored Form of a Quadratic Function

FACTORED FORM $y = ax^2 + bx + c$ can be written as $0 = a(x - p)(x - q)$, where p and q are the zeros of the function. The x-intercepts of the graph correspond to the zeros of the function. Two zeros denote 3 intervals of x values.

GRAPH For the function $y = 2x^2 + 3x - 14$, write the equation $0 = 2x^2 + 3x - 14$ in factored form to identify the zeros.

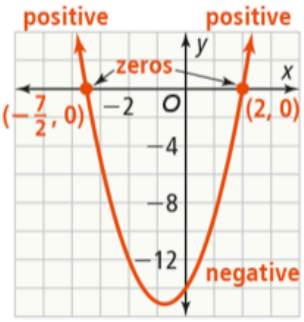
$0 = 2x^2 + 3x - 14$

$0 = (2x + 7)(x - 2)$

The zeros of the function are $x = -\frac{7}{2}$ and $x = 2$.

intervals where function values are positive: $x < -\frac{7}{2}$, and $x > 2$

interval where function values are negative: $-\frac{7}{2} < x < 2$



Notes:

Examples and Questions

Examples 1
Q: How is using Distributive Property helpful when factoring a quadratic expression?

Examples 2
Q: How does the graph verify the values of the zeros of a function?

Examples 3
Q: Why is it important to write the equation in factored form to solve?

Examples 4
Q: Why is it helpful to factor out the GCF as a step in finding the zeros?

Q: Why is one of the zeros of the function not a valid solution in the context of the situation?

Examples 5
Q: How can a function be both positive and negative? Explain algebraically and graphically.
Q: Why is it important to identify positive and negative intervals of a function?

Examples 6
Q: Why is it necessary to use a point other than the x-intercepts to write an equation for a parabola?

Q: Why are you given 3 points to determine the equation instead of 2?

Practice and Problem Solving

Complete MathXL for School: Practice and Problem Solving (online)
Complete MathXL for School: Mixed Review (online)

Challenge: #10, 15, 39, 41, 42, 45 – key will be posted in Power School Learning.

Lesson Quiz 2.3