Algebra II

Section 5.6

The Quadratic Formula

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Bell Ringer

1. Financing the cost of an automobile, C, is equal to the sticker price, S, plus interest, I. The sticker price is equal to the base price, B, plus optional features, F. Write a system of equations that models this situation?

$C = S + I$

$S = B + F$

2. Factor $x^2 + 3x - 40$ $(x+8)(x-5)$

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Today we are working with quadratics that might not factor so nicely. We are solving quadratics, which is where the parabola cross the x-axis.

This formula can be used to solve any quadratic equation. $f(x) = ax^2 + bx + c$

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

it's a sing-a-long...

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Find the zeros of the function using the Quadratic Formula.

1. $f(x) = 2x^2 - 16x + 27$

$a = 2$

$b = -16$

$c = 27$

$x = \frac{16 \pm \sqrt{256 - 4(2)(27)}}{2(2)}$

$x = \frac{16 \pm \sqrt{40}}{4} = \frac{16 \pm 2\sqrt{10}}{4}$

$= 4 \pm \frac{\sqrt{10}}{2}$

≈ 5.58

≈ 2.42

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Find the zeros of the function using the Quadratic Formula.

2. $f(x) = 4x^2 - 5x - 6$

$a = 4$

$b = -5$

$c = -6$

$x = \frac{5 \pm \sqrt{25 - 4(4)(-6)}}{8}$

$x = \frac{5 \pm \sqrt{121}}{8}$

$x = \frac{5 \pm 11}{8}$

$x = 2 \quad x = -\frac{3}{4}$

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Find the zeros of the function using the Quadratic Formula.

3. $f(x) = x^2 + 10x + 2$

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

$a = 1$

$b = 10$

$c = 2$

$x = \frac{-10 \pm \sqrt{100 - 4(1)(2)}}{2}$

$x = \frac{-10 \pm \sqrt{92}}{2}$

$92 = 4 \cdot 23$

$\sqrt{92} = 2\sqrt{23}$

$x = \frac{-10 \pm 2\sqrt{23}}{2}$

$x = -5 \pm \sqrt{23}$

$x \approx -.20$

$x \approx -9.8$

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Conclusion

1. What is the Quadratic Formula?

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

2. What is it really finding?

x-intercepts

3. Is this the only way to solve quadratics?

No

4. Will the Quadratic formula always work when solving?

yes

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

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