

Algebra 1

Lesson 10.6B

Solve Quadratic Equations by the Quadratic Formula

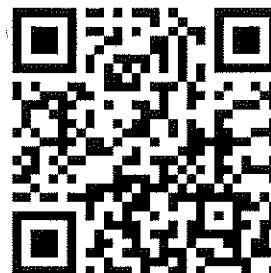
NOTES:

The Quadratic Formula

Given a quadratic equation in standard form $ax^2 + bx + c = 0$ then the solutions to the equation can be found from:

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

Need to see a few examples?



Example 1. Solve using the Quadratic Formula.

(a) $2x^2 + 7x - 9 = 0$
 $a=2$
 $b=7$
 $c=-9$
 $x = \frac{-(7) \pm \sqrt{(7)^2 - 4(2)(-9)}}{2(2)}$
 $x = \frac{-7 \pm \sqrt{49 + 72}}{4}$
 $x = \frac{-7 \pm \sqrt{121}}{4}$
 $x = \frac{-7 \pm 11}{4}$
 Solutions: $x = 1, -4.5$

(b) $2x^2 - 7 = x$
 $-x -x$
 $2x^2 - x - 7 = 0$
 $a=2$
 $b=-1$
 $c=-7$
 $x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(2)(-7)}}{2(2)}$
 $x = \frac{1 \pm \sqrt{1 + 56}}{4}$
 $x = \frac{1 \pm \sqrt{57}}{4}$
 Solutions: $x \approx 2.14, -1.64$

(c) $4x^2 + 3x = 1$
 $4x^2 + 3x - 1 = 0$
 $a=4$
 $b=3$
 $c=-1$
 $x = \frac{-3 \pm \sqrt{3^2 - 4(4)(-1)}}{2(4)}$
 $x = \frac{-3 \pm \sqrt{9 + 16}}{8}$
 $x = \frac{-3 \pm 5}{8}$
 $x = 0.25, -1$

CONCEPT SUMMARY

For Your Notebook

Methods for Solving Quadratic Equations

Method	Lesson(s)	When to Use
Factoring	9.4-9.8	Use when a quadratic equation can be factored easily.
Graphing	10.3	Use when approximate solutions are adequate.
Finding square roots	10.4	Use when solving an equation that can be written in the form $x^2 = d$.
Completing the square	10.5	Can be used for any quadratic equation $ax^2 + bx + c = 0$ but is simplest to apply when $a = 1$ and b is an even number.
Quadratic formula	10.6	Can be used for any quadratic equation.

EXACT

APPROXIMATE

Need some help determining when it is best to use each of these methods?

