



Present

The Adventurous World of Algebra (Part 2)

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I. Introduction to

Quadratic Equations

- A. Squares and Squareroots
 - 1. radicals
 - 2. perfect squares
- B. Multiplying Binomials – FOIL
- C. Graphs of Quadratics
 - 1. quadratic vs. linear equations
 - 2. quadratic standard form
 - 3. parabolas
 - 4. vertex
 - 5. y intercept
 - 6. axis of symmetry

II. Quadratic Roots and Factors

- A. Factoring Quadratic Equations
 - 1. FOIL reminder
 - 2. reverse FOIL and trial-and-error
- B. Finding Roots From Factors
- C. Single Root Quadratics
- D. Two Factoring Shortcuts
- E. The Quadratic Formula
 - 1. finding roots

2. discriminant

F. Imaginary and Complex Numbers

- 1. i
- 2. real, imaginary and complex numbers

G. A Practical Example of Quadratics

III. Polynomials

- A. General Polynomials
 - 1. leading coefficient
 - 2. constant term
- B. Multiplying Polynomials
- C. Factoring Polynomials
 - 1. polynomial long division
 - 2. degree limits number of roots
- D. Properties of Polynomial Graphs
 - 1. degree dictates shape
 - 2. values of coefficients dictate shape
 - 3. even degree vs. odd degree
 - 4. constant is y-intercept

Other titles available from *The Standard Deviants*:

Algebra *Part 1*
Algebra *Part 2*
Microeconomics
Macroeconomics
Statistics *Part 1*
Statistics *Part 2*
Statistics *Part 3*
Calculus *Part 1*
Calculus *Part 2*
Physics
Biology
Pre-Calculus *Part 1*
Pre-Calculus *Part 2*
Chemistry *Part 1*
Chemistry *Part 2*
Chemistry *Part 3*
Psychology
Finance *Part 1*
Finance *Part 2*
Finance *Part 3*
Accounting *Part 1*
Accounting *Part 2*
Geology *Part 1*

Geology *Part 2*
Basic Math
Trigonometry *Part 1*
Trigonometry *Part 2*
Organic Chemistry *Part 1*
Organic Chemistry *Part 2*
Organic Chemistry *Part 3*
Astronomy *Part 1*
Astronomy *Part 2*
Anatomy *Part 1*
Anatomy *Part 2*
Business Law
English Composition
Spanish *Part 1*
Spanish *Part 2*
Marketing
Differential Equations
Sociology *Part 1*
Sociology *Part 2*
Physics *Part 1*
Physics *Part 2*
Nutrition
French *Part 1*

French *Part 2*
Geometry
Pre-Algebra

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FORMULAS

Square Root:

$$\sqrt{\quad} \text{ or } a^{\frac{1}{2}}$$

FOIL:

First, Inner, Outer, Last

$$(2x + 1)(2x + 1) \text{ First } 2x \cdot 2x = 4x^2$$

$$(2x + 1)(2x + 1) \text{ Inner } 1 \cdot 2x = 2x$$

$$(2x + 1)(2x + 1) \text{ Outer } 2x \cdot 1 = 2x$$

$$(2x + 1)(2x + 1) \text{ Last } 1 \cdot 1 = 1$$

The Top 3 foil related things not to do the night before your algebra exam:

1. *foil origami,*
2. *foiling your pets,*
3. *playing with your foil.*

Standard Form for Quadratic:

$$y = ax^2 + bx + c$$

Axis of Symmetry:

$$x = \frac{-b}{2a}$$

Roots vs. Factors

If $x=r$ is a root,
then $(x-r)$ is a factor

Roots vs. Factors:

If $x = r$ is a root,
then $(x - r)$ is a factor.

Quadratic Formula:

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

Discriminant:

$$b^2 - 4ac$$

Imaginary Unit (i)

$$i = \sqrt{-1}$$

$$i = (-1)^{\frac{1}{2}}$$

$$i^2 = -1$$

Complex Number:

real number + imaginary number

$$3 + 4i \text{ or } 0 + 2i$$

Equation for Motion of Falling Object

$$y = -\frac{1}{2}gx^2 + vx + h$$

g = acceleration of gravity

v = initial velocity

h = initial height