

# Solving Polynomial Equations

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## LESSON OVERVIEW

|                               |                                      |
|-------------------------------|--------------------------------------|
| <b>Subject(s)</b>             | Mathematics                          |
| <b>Topic or Unit of Study</b> | Polynomials and Polynomial Functions |
| <b>Grade/Level</b>            | Grade 10                             |
| <b>Objective</b>              |                                      |
| <b>Summary</b>                |                                      |

## IMPLEMENTATION

|  |                                      |
|--|--------------------------------------|
| <b>Learning Context</b>                    |                                      |
| <b>Teaching Strategies</b>                 |                                      |
| <b>Time Allotment</b>                      | 1 class periods. 50 Mins. per class. |
| <b>Sample Student Products</b>             |                                      |
| <b>Author's Comments &amp; Reflections</b> |                                      |

## PROCEDURE

### Anticipatory Set

### Modeling

#### **Solve by Factoring**

#### **Factoring Perfect Square Trinomials**

$$a^2 + 2ab + b^2 = (a + b)^2 \quad \leftarrow \text{makes the middle term positive}$$

$$a^2 - 2ab + b^2 = (a - b)^2 \quad \leftarrow \text{makes the middle term negative}$$

#### **Factoring a Difference of Two Squares**

$$a^2 - b^2 = (a + b)(a - b) \quad \leftarrow \text{removes the middle term}$$

#### **Sum and Difference of Cubes**

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

#### **Factor Using a Property**

**Factoring by Using a Quadratic Pattern**

**Solving a Polynomial Equation**

rewrite cubic as sum of cubes, factor, simplify, quadratic formula

**Solving a Higher-Degree Polynomial Equation**

**Solve by Graphing**

**Finding the Relative Maximum and Minimum by Graphing**

**Finding the Relative Maximum and Minimum without Graphing**

**Guided Practice**

**Independent Practice**

**Closure**

**Follow-Up**

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**MATERIALS AND RESOURCES**

**Instructional Materials****Resources****STANDARDS & ASSESSMENT****Standards**

**Display:**  Collapse All  Expand All

▼ **CA- California K-12 Academic Content Standards**

▼ **Subject:** Mathematics

▼ **Grade:** Grades Eight Through Twelve The standards for grades eight through twelve are organized differently from those for kindergarten through grade seven. In this section strands are not used for organizational purposes as they are in the elementary grades because the mathematics studied in grades eight through twelve falls naturally under discipline headings: algebra, geometry, and so forth. Many schools teach this material in traditional courses; others teach it in an integrated fashion. To allow local educational agencies and teachers flexibility in teaching the material, the standards for grades eight through twelve do not mandate that a particular discipline be initiated and completed in a single grade. The core content of these subjects must be covered; students are expected to achieve the standards however these subjects are sequenced.

Standards are provided for algebra I, geometry, algebra II, trigonometry, mathematical analysis, linear algebra, probability and statistics, Advanced Placement probability and statistics, and calculus. Many of the more advanced subjects are not taught in every middle school or high school. Moreover, schools and districts have different ways of combining the subject matter in these various disciplines. For example, many schools combine some trigonometry, mathematical analysis, and linear algebra to form a precalculus course. Some districts prefer offering trigonometry content with algebra II.

▼ **Area:** Algebra II This discipline complements and expands the mathematical content and concepts of algebra I and geometry. Students who master algebra II will gain experience with algebraic solutions of problems in various content areas, including the solution of systems of quadratic equations, logarithmic and exponential functions, the binomial theorem, and the complex number system.

**Sub-Strand 4.0:** Students factor polynomials representing the difference of squares, perfect square trinomials, and the sum and difference of two cubes.

**Assessment Plan****Assessment/Rubrics**