

PETERS TOWNSHIP SCHOOL DISTRICT

CORE BODY OF KNOWLEDGE (CBK)

ALGEBRA II ACADEMIC

GRADE 10-11

For each of the sections that follow, students may be required to analyze, recall, explain, interpret, apply, or evaluate the particular concepts being taught. Concepts will be presented, applied, and assessed analytically, numerically, and graphically.

COURSE DESCRIPTION

This course is a study of the language, concepts, and techniques of Algebra that will prepare students to approach and solve problems following a logical succession of steps. This course is the foundation for high school mathematics courses. Topics include the study of functions (quadratic, polynomial, exponential, logarithmic, rational, radical, and trigonometric), probability and statistics. Real world applications are presented within the course content and a function's approach is emphasized. Appropriate technology will be utilized. It is required that the student purchase his/her own graphing calculator.

STUDY SKILLS

- Students will take notes during class discussions and maintain notes and assignments in an organized binder/notebook
- Students will complete assigned problem sets and readings in accordance with deadlines
- Students will work individually and in peer groups as a means to learn and develop problem solving skills relevant to the course and life
- Students will collect, analyze and reflect on data collected during group work to obtain a deeper understanding of content discussed in class and covered in problem sets

MAJOR UNIT THEMES:

1. Foundations for Functions

- Identify sets of numbers
- Apply properties of real numbers
- Calculate square roots
- Simplify algebraic expressions
- Apply properties of exponents
- Differentiate between relations and functions
- Understand and use function notation
- Explore transformations
- Understand parent functions

2. Functions

- Solve linear equations and inequalities
- Apply proportional reasoning
- Graph linear functions
- Write linear functions
- Solve linear inequalities in two variables
- Transform linear functions
- Fit data with linear models
- Solve absolute-value equations and inequalities
- Use absolute-value functions

3. Linear Systems

- Use graphs and tables to solve linear systems
- Use algebraic methods to solve linear systems
- Solve systems of linear inequalities
- Apply linear programming

4. Quadratic Functions

- Use transformations to graph quadratic functions
- Apply properties of quadratic functions in standard form
- Solve quadratic equations by graphing and factoring
- Complete the square
- Understand complex roots and numbers
- Apply the quadratic formula
- Solve quadratic inequalities
- Fit data with quadratic models
- Compute operations with complex numbers

5. Polynomial Functions

- Understand polynomials
- Multiply polynomials
- Divide polynomials
- Factor polynomials
- Find real roots of polynomial functions
- Apply the fundamental theorem of algebra
- Investigate graphs of polynomial equations
- Transform polynomial functions
- Fit data with polynomial models

6. Exponential and Logarithmic Functions

- Understand exponential functions and growth and decay
- Find inverses of relations and functions
- Understand logarithmic functions
- Apply properties of logarithms
- Solve exponential and logarithmic equations and inequalities
- Use the natural base
- Transform exponential and logarithmic functions
- Fit data with exponential and logarithmic models

7. Rational and Radical Functions

- Understand variation functions
- Multiply and divide rational expressions
- Add and subtract rational expressions
- Understand rational functions
- Solve rational equations and inequalities
- Understand radical expressions and radical exponents
- Apply radical functions
- Solve radical equations and inequalities

8. Properties and Attributes of Functions

- Use multiple representations of functions
- Understand piecewise functions
- Transform functions
- Use operations with functions
- Understand functions and their inverses
- Model real-world data

9. Probability and Statistics

- Differentiate between permutations and combinations
- Understand theoretical and experimental probability
- Differentiate between independent and dependent events
- Calculate compound events
- Use measures of central tendency and variation
- Apply binomial distributions

Resources

Textbook

Holt McDougal Algebra 2 2011

- Chapter Resources Book
- Practice and Problem Solving Workbook
- Know-It Notebook
- Success for Every Learner Workbook
- Algebra 2 Lab Activities
- Graphing Calculator
- Kuta-Software Worksheet Generator
- my.hrw.com (Homework Help)
- Student One Stop CD

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