COURSE: Topics in Applied Mathematics	GRADE(S): 12
UNIT 1: Polynomial Functions	TIME FRAME: 10 Days

National Standards: NCTM STANDARDS

1. NUMBER AND OPERATIONS
A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA
A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships
D. Analyze change in various contexts

3. GEOMETRY
C. Apply transformations and use symmetry to analyze mathematical situations
D. Use visualization, spatial reasoning, and geometric modeling to solve problems

4. MEASUREMENT
A. Understand measurable attributes of objects and the units, systems, and processes of measurement
B. Apply appropriate techniques, tools, and formulas to determine measurements

5. DATA ANALYSIS AND PROBABILITY
C. Develop and evaluate inferences and predictions that are based on data
D. Understand and apply basic concepts of probability

6. PROBLEM SOLVING
A. Build new mathematical knowledge through problem solving
B. Solve problems that arise in mathematics and in other contexts
C. Apply and adapt a variety of appropriate strategies to solve problems
D. Monitor and reflect on the process of mathematical problem solving

7. REASONING AND PROOF
A. Recognize reasoning and proof as fundamental aspects of mathematics
B. Make and investigate mathematical conjectures
C. Develop and evaluate mathematical arguments and proofs
D. Select and use various types of reasoning and methods of proof

8. COMMUNICATION
A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate the mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

9. CONNECTIONS
A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

10. REPRESENTATION
A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

PA ACADEMIC STANDARDS FOR MATHEMATICS:	**UNIT OBJECTIVES:**
M11.A.2.2.2 Simplify/evaluate expressions involving multiplying with exponents (e.g. $x^6 * x^7 = x^{13}$), powers of powers (e.g., $(x^6)^7=x^{42}$) and powers of products $(2x^2)^3=8x^6$ (positive exponents only). **M11.A.3.1.1** Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used). **M11.D.1.1.1** Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically. **M11.D.2.1.2** Identify or graph functions, linear equations or linear inequalities on a coordinate plane. **M11.D.2.1.3** Write, solve and/or apply a linear equation (including problem situations). **M11.D.2.1.5** Solve quadratic equations using factoring (integers only – not including completing the square or the Quadratic Formula). **M11.D.2.2.2** Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax^2+bx+c where a is not equal to 0). **M11.D.4.1.1** Match the graph of a given function to its table or equation. **M11.E.3.2.1** Determine the number of permutations and/or combinations or apply the fundamental counting principle. (Formula provided on the reference sheet).	1. Classify Polynomials. 2. Model data using polynomial functions. 3. Add, subtract, and multiply polynomials. 4. Factor polynomial functions to find the zeroes. 5. Solve polynomial equations by factoring and by graphing. 6. Use Pascal's Triangle and the binomial theorem.
ACTIVITIES: Teacher directed differentiated instructional projects and activities are ongoing and based on student need.	**ASSESSMENTS:** • Observation and questioning • Presentations and discussions • Projects and investigations • Mathematical writing • Homework • Quizzes • Tests

Prentice Hall Algebra 2, 2007:
All-in-One Student Workbook
Skill and Concept Review Masters
Grab & Go Chapter Support Files

Additional Activities:

1. The Big Picture
2. Manipulating a Polynomial
3. The Early Days of Algebra
4. Picture IDs for Polynomial Functions
5. Zeroes of a Function
6. No Joking Around
7. What Happened When Zonk...
8. Considering All the Factors
9. Expand Your Mind
10. Taste the Rainbow

REMEDIATION:

- Re-teaching Worksheets
- Factoring Polynomials

Prentice Hall Algebra 2, 2007:
Hands-On Activities
Skill and Concept Review Masters
Online Video Tutor
MindPoint Quiz Show CD-ROM: End-of-Chapter reviews

ENRICHMENT:

- Mystery Mathematician
- Fast Factorization
- Good Advice
- A Relative Who Wears Britches
- Cross a Lion with a Camel
- If Figs Come From a Fig Tree
- What do Skeletons Say?
- Building Blocks

Prentice Hall Math, 2007:
Online Active Math: Built-in interactive explorations
MindPoint Quiz Show CD-ROM
Enrichment Masters
PHSchool.com: Online support for Mathematics
Web Codes within the textbook provide access to:

- Vocabulary Quizzes
- Chapter Tests
- Chapter Projects
- Math at Work

RESOURCES:
Prentice Hall Algebra 2, 2007
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United Streaming

WEB SITES
www.algebrahelp.com
www.coolmath.com
www.mathleague.com
www.interactmath.com

Revised 10/07

COURSE: Topics in Applied Mathematics	GRADE(S): 12
UNIT 2: Radical Functions	TIME FRAME: 13 Days

National Standards: NCTM STANDARDS

1. NUMBER AND OPERATIONS

A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems

B. Understand meanings of operations and how they relate to one another

C. Compute fluently and make reasonable estimates

2. ALGEBRA

A. Understand patterns, relations, and functions

B. Represent and analyze mathematical situations and structures using algebraic symbols

C. Use mathematical models to represent and understand quantitative relationships

D. Analyze change in various contexts

3. GEOMETRY

C. Apply transformations and use symmetry to analyze mathematical situations

D. Use visualization, spatial reasoning, and geometric modeling to solve problems

4. MEASUREMENT

A. Understand measurable attributes of objects and the units, systems, and processes of measurement

B. Apply appropriate techniques, tools, and formulas to determine measurements

5. DATA ANALYSIS AND PROBABILITY

C. Develop and evaluate inferences and predictions that are based on data

6. PROBLEM SOLVING

A. Build new mathematical knowledge through problem solving

B. Solve problems that arise in mathematics and in other contexts

C. Apply and adapt a variety of appropriate strategies to solve problems

D. Monitor and reflect on the process of mathematical problem solving

7. REASONING AND PROOF

A. Recognize reasoning and proof as fundamental aspects of mathematics

B. Make and investigate mathematical conjectures

C. Develop and evaluate mathematical arguments and proofs

D. Select and use various types of reasoning and methods of proof

8. COMMUNICATION

A. Organize and consolidate their mathematical thinking through communication

B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others

C. Analyze and evaluate the mathematical thinking and strategies of others

D. Use the language of mathematics to express mathematical ideas precisely

9. CONNECTIONS

A. Recognize and use connections among mathematical ideas

B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole

C. Recognize and apply mathematics in contexts outside of mathematics

10. REPRESENTATION

A. Create and use representations to organize, record, and communicate mathematical ideas

B. Select, apply, and translate among mathematical representations to solve problems

C. Use representations to model and interpret physical, social, and mathematical phenomena

PA ACADEMIC STANDARDS FOR MATHEMATICS:	UNIT OBJECTIVES:
M11.A.2.2.1 Simplify/evaluate expressions involving positive and negative exponents, roots and/or absolute value (may contain all types of real numbers - exponents should not exceed power of 10). **M11.A.2.2.2** Simplify/evaluate expressions involving multiplying with exponents (e.g. $x^6 * x^7 = x^{13}$), powers of powers (e.g., $(x^6)^7=x^{42}$) and powers of products $(2x^2)^3=8x^6$ (positive exponents only). **M11.A.3.1.1** Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used). **M11.D.1.1.1** Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically. **M11.D.1.1.2** Determine if a relation is a function given a set of points or a graph. **M11.D.1.1.3** Identify the domain, range or inverse of a relation (may be presented as ordered pairs or a table). **M11.D.2.1.2** Identify or graph functions, linear equations or linear inequalities on a coordinate plane. **M11.D.2.1.3** Write, solve and/or apply a linear equation (including problem situations). **M11.D.2.1.5** Solve quadratic equations using factoring (integers only – not including completing the square or the Quadratic Formula). **M11.D.4.1.1** Match the graph of a given function to its table or equation.	1. Simplify n^{th} roots. 2. Multiply and divide radical expressions. 3. Simplify expressions with rational exponents. 4. Solve radical equations. 5. Use operations on functions. 6. Find the composite of two functions. 7. Find the inverse of a relation or function. 8. Graph radical functions.
ACTIVITIES: Teacher directed differentiated instructional projects and activities are ongoing and based on student need.	**ASSESSMENTS:** • Observation and questioning • Presentations and discussions • Projects and investigations • Mathematical writing • Homework • Quizzes • Tests

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Additional Activities:

1. Radicals
2. Evaluate the Expression – Radicals
3. Divide Radicals
4. Fractional Exponents
5. Duplicate Key
6. Cross Number Puzzle
7. Solving Radical Equations
8. Operations on Functions
9. Composition and Inverses of Functions
10. Inverse Review
11. Feed a Cat Lemons
12. Inverse Project
13. Graphing Radical Functions

REMEDIATION:

- Re-teaching Worksheets
- Radical Functions
- Solve Radical Equations
- Combining Functions
- Inverses
- Graphing Radical Functions

Prentice Hall Algebra 2, 2007:
Hands-On Activities
Skill and Concept Review Masters
Online Video Tutor
MindPoint Quiz Show CD-ROM: End-of-Chapter reviews

ENRICHMENT:

- Handshake Problem
- An Unsolved Problem
- A Moonlighting Mathematician
- A Closer Look at Compounding

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Online Active Math: Built-in interactive explorations
MindPoint Quiz Show CD-ROM
Enrichment Masters
PHSchool.com: Online support for Mathematics
Web Codes within the textbook provide access to:

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- Math at Work

RESOURCES:
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WEB SITES
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www.coolmath.com
www.mathleague.com
www.interactmath.com

Revised 10/07

COURSE: Topics in Applied Mathematics	GRADE(S): 12
UNIT 3: Exponential and Logarithmic Functions	TIME FRAME: 12 Days

National Standards: NCTM STANDARDS

1. NUMBER AND OPERATIONS
A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA
A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships
D. Analyze change in various contexts

3. GEOMETRY
C. Apply transformations and use symmetry to analyze mathematical situations
D. Use visualization, spatial reasoning, and geometric modeling to solve problems

4. MEASUREMENT
A. Understand measurable attributes of objects and the units, systems, and processes of measurement
B. Apply appropriate techniques, tools, and formulas to determine measurements

5. DATA ANALYSIS AND PROBABILITY
C. Develop and evaluate inferences and predictions that are based on data

6. PROBLEM SOLVING
A. Build new mathematical knowledge through problem solving
B. Solve problems that arise in mathematics and in other contexts
C. Apply and adapt a variety of appropriate strategies to solve problems
D. Monitor and reflect on the process of mathematical problem solving

7. REASONING AND PROOF
A. Recognize reasoning and proof as fundamental aspects of mathematics
B. Make and investigate mathematical conjectures
C. Develop and evaluate mathematical arguments and proofs
D. Select and use various types of reasoning and methods of proof

8. COMMUNICATION
A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate the mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

9. CONNECTIONS
A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

10. REPRESENTATION
A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

PA MATH ASSESSMENT ANCHORS:	UNIT OBJECTIVES:
M11.A.2.2.1 Simplify/evaluate expressions involving positive and negative exponents, roots and/or absolute value (may contain all types of real numbers - exponents should not exceed power of 10). **M11.A.2.2.2** Simplify/evaluate expressions involving multiplying with exponents (e.g. $x^6 * x^7 = x^{13}$), powers of powers (e.g., $(x^6)^7=x^{42}$) and powers of products $(2x^2)^3=8x^6$ (positive exponents only). **M11.A.3.1.1** Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used). **M11.D.1.1.1** Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically. **M11.D.2.1.2** Identify or graph functions, linear equations or linear inequalities on a coordinate plane. **M11.D.2.1.3** Write, solve and/or apply a linear equation (including problem situations). **M11.D.3.1.1** Identify, describe and/or use constant or varying rates of change. **M11.D.3.1.2** Determine how a change in one variable relates to a change in a second variable (e.g., y=4/x, if x doubles, what happens to y?). **M11.D.4.1.1** Match the graph of a given function to its table or equation.	1. Model exponential growth and decay. 2. Identify translations and asymptotes on a graph. 3. Write and solve logarithmic equations. 4. Graph logarithmic functions. 5. Use compound interest formulas. 6. Use the properties of logarithms. 7. Solve exponential and logarithmic equations.
ACTIVITIES: Teacher directed differentiated instructional projects and activities are ongoing and based on student need. **Prentice Hall Algebra 2, 2007:** All-in-One Student Workbook Skill and Concept Review Masters Grab & Go Chapter Support Files	**ASSESSMENTS:** • Observation and questioning • Presentations and discussions • Projects and investigations • Mathematical writing • Homework • Quizzes • Tests

Additional Activities:

1. Are You Up for This?
2. Exponential Potential
3. The M&M Function
4. The King's Chessboard – Exponential Functions
5. Logarithms and Blues
6. Logarithms
7. Twizzler Graph Activity
8. Simple and Compound Interest
9. Student Worksheet – Compound Interest
10. Closer Look at Compounding
11. Compound Interest Practice
12. Inflation
13. Guided Discovery – Log Properties
14. Call a Person Who…
15. Vampire Doctor
16. Papa Shoe
17. Shoes Make Poor Debaters

REMEDIATION:

- Properties of Logarithms
- Re-teaching Worksheets

Prentice Hall Algebra 2, 2007:
Hands-On Activities
Skill and Concept Review Masters
Online Video Tutor
MindPoint Quiz Show CD-ROM: End-of-Chapter reviews

ENRICHMENT:

- Rhinos and M&M's
- Log Jams
- A Cooperative Physicist
- What do you Call Pants
- Compound Interest

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MindPoint Quiz Show CD-ROM
Enrichment Masters
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Web Codes within the textbook provide access to:

- Vocabulary Quizzes
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- Math at Work

RESOURCES:
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WEB SITES
www.algebrahelp.com
www.coolmath.com
www.mathleague.com
www.interactmath.com
http://www.themathpage.com

COURSE: Topics in Applied Mathematics	GRADE(S): 12
UNIT 4: Periodic Functions and Trigonometry	TIME FRAME: 10 Days

National Standards: NCTM Standards

1. NUMBER AND OPERATIONS
A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA
A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships
D. Analyze change in various contexts

3. GEOMETRY
A. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships
B. Specify locations and describe spatial relationships using coordinate geometry and other representational systems
C. Apply transformations and use symmetry to analyze mathematical situations
D. Use visualization, spatial reasoning, and geometric modeling to solve problems

4. MEASUREMENT
A. Understand measurable attributes of objects and the units, systems, and processes of measurement
B. Apply appropriate techniques, tools, and formulas to determine measurements

6. PROBLEM SOLVING
A. Build new mathematical knowledge through problem solving
B. Solve problems that arise in mathematics and in other contexts
C. Apply and adapt a variety of appropriate strategies to solve problems
D. Monitor and reflect on the process of mathematical problem solving

7. REASONING AND PROOF
A. Recognize reasoning and proof as fundamental aspects of mathematics
B. Make and investigate mathematical conjectures
C. Develop and evaluate mathematical arguments and proofs
D. Select and use various types of reasoning and methods of proof

8. COMMUNICATION
A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate the mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

9. CONNECTIONS
A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

10. REPRESENTATION
A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

PA MATH ASSESSMENT ANCHORS:

M11.A.3.1.1 Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used).

M11.D.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.

M11.D.1.1.3 Identify the domain, range or inverse of a relation (may be presented as ordered pairs or a table).

M11.D.2.1.2 Identify or graph functions, linear equations or linear inequalities on a coordinate plane.

M11.D.4.1.1 Match the graph of a given function to its table or equation.

UNIT OBJECTIVES:

1. Identify amplitude, cycles, and period of periodic functions.
2. Identify side lengths of special right triangles.
3. Find angles in standard position.
4. Use the unit circle to find trigonometric functions of given angles.
5. Use radian measure for angles.
6. Find arc length.
7. Identify properties of the sine function.
8. Identify properties of the cosine function.
9. Identify and evaluate reciprocal trigonometric functions.

ACTIVITIES:

Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

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All-in-One Student Workbook
Skill and Concept Review Masters
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Additional Activities:

1. Student Activity – Amplitude and Period
2. Lesson on Excellence
3. Special Triangles
4. Why Didn't the Skeleton Cross the Road?
5. Radian the Snowman
6. Converting Angle Measurements
7. Were Screams Coming from the Kitchen?
8. Staggered Starts
9. Sine Curves and Spaghetti
10. Sine and Cosine Waves
11. Trig Cut Ups
12. Invent a Plane

ASSESSMENTS:

- Observation and questioning
- Presentations and discussions
- Projects and investigations
- Mathematical writing
- Homework
- Quizzes
- Tests

REMEDIATION:

- That's Right
- Re-teaching Worksheets

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Hands-On Activities
Skill and Concept Review Masters
Online Video Tutor
MindPoint Quiz Show CD-ROM: End-of-Chapter reviews

	ENRICHMENT: • Graphically Speaking • The Bungee Jumper • The Diver Problem • The Fish Population • Nautical Miles • Word Ladders • Even and Odd Functions • Trig Parent Graphs **Prentice Hall Math, 2007:** Online Active Math: Built-in interactive explorations MindPoint Quiz Show CD-ROM Enrichment Masters PHSchool.com: Online support for Mathematics Web Codes within the textbook provide access to: • Vocabulary Quizzes • Chapter Tests • Chapter Projects • Math at Work **RESOURCES:** **Prentice Hall Algebra 2, 2007** PLATO Study Island NetTrekker United Streaming **WEB SITES** www.algebrahelp.com www.coolmath.com www.mathleague.com www.interactmath.com

COURSE: Topics in Applied Mathematics	GRADE(S): 12
UNIT 5: Trigonometric Identities and Equations	TIME FRAME: 10 Days

NATIONAL STANDARDS: NCTM Standards

1. NUMBER AND OPERATIONS

A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems

B. Understand meanings of operations and how they relate to one another

C. Compute fluently and make reasonable estimates

2. ALGEBRA

A. Understand patterns, relations, and functions

B. Represent and analyze mathematical situations and structures using algebraic symbols

C. Use mathematical models to represent and understand quantitative relationships

D. Analyze change in various contexts

3. GEOMETRY

A. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships

B. Specify locations and describe spatial relationships using coordinate geometry and other representational systems

C. Apply transformations and use symmetry to analyze mathematical situations

D. Use visualization, spatial reasoning, and geometric modeling to solve problems

4. MEASUREMENT

A. Understand measurable attributes of objects and the units, systems, and processes of measurement

B. Apply appropriate techniques, tools, and formulas to determine measurements

6. PROBLEM SOLVING

A. Build new mathematical knowledge through problem solving

B. Solve problems that arise in mathematics and in other contexts

C. Apply and adapt a variety of appropriate strategies to solve problems

D. Monitor and reflect on the process of mathematical problem solving

7. REASONING AND PROOF

A. Recognize reasoning and proof as fundamental aspects of mathematics

B. Make and investigate mathematical conjectures

C. Develop and evaluate mathematical arguments and proofs

8. COMMUNICATION

A. Organize and consolidate their mathematical thinking through communication

B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others

C. Analyze and evaluate the mathematical thinking and strategies of others

D. Use the language of mathematics to express mathematical ideas precisely

9. CONNECTIONS

A. Recognize and use connections among mathematical ideas

B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole

C. Recognize and apply mathematics in contexts outside of mathematics

10. REPRESENTATION

A. Create and use representations to organize, record, and communicate mathematical ideas

B. Select, apply, and translate among mathematical representations to solve problems

C. Use representations to model and interpret physical, social, and mathematical phenomena

PA MATH ASSESSMENT ANCHORS:

M11.A.3.1.1 Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used).

M11.D.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.

M11.D.2.1.2 Identify or graph functions, linear equations or linear inequalities on a coordinate plane.

M11.D.2.1.3 Write, solve and/or apply a linear equation (including problem situations).

M11.D.2.2.3 Simplify algebraic fractions.

M11.D.4.1.1 Match the graph of a given function to its table or equation.

UNIT OBJECTIVES:

1. Use trigonometric identities.
2. Solve trigonometric equations.
3. Use the Law of Sines.
4. Use trigonometry to find the area of a Triangle.
5. Use the Law of Cosines.

ACTIVITIES:

Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

Prentice Hall Algebra 2, 2007:
All-in-One Student Workbook
Skill and Concept Review Masters
Grab & Go Chapter Support Files

Additional Activities:

1. No Joking Around
2. Solving Trigonometric Equations
3. Unemployed Jester
4. What's Your Angle
5. A Cow with no Legs

ASSESSMENTS:

- Observation and questioning
- Presentations and discussions
- Projects and investigations
- Mathematical writing
- Homework
- Quizzes
- Tests

REMEDIATION:

- Re-teaching Worksheets
- Determine the Area of the Triangle

Prentice Hall Algebra 2, 2007:
Hands-On Activities
Skill and Concept Review Masters
Online Video Tutor
MindPoint Quiz Show CD-ROM: End-of-Chapter reviews

	ENRICHMENT: • No Joking Around • A Plumber's Favorite Flower • What's Your Sine? • Reduction to a Canonical Form **Prentice Hall Math, 2007:** Online Active Math: Built-in interactive explorations MindPoint Quiz Show CD-ROM Enrichment Masters PHSchool.com: Online support for Mathematics Web Codes within the textbook provide access to: • Vocabulary Quizzes • Chapter Tests • Chapter Projects • Math at Work **RESOURCES:** **Prentice Hall Algebra 2, 2007** PLATO Study Island NetTrekker United Streaming **WEB SITES** www.algebrahelp.com www.coolmath.com www.mathleague.com www.interactmath.com

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COURSE: Topics in Applied Mathematics	GRADE(S): 12
UNIT 6: Conic Sections	TIME FRAME: 6 Days

NATIONAL STANDARDS: NCTM Standards

1. NUMBER AND OPERATIONS
A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA
A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships
D. Analyze change in various contexts

3. GEOMETRY
A. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships
B. Specify locations and describe spatial relationships using coordinate geometry and other representational systems
C. Apply transformations and use symmetry to analyze mathematical situations
D. Use visualization, spatial reasoning, and geometric modeling to solve problems

4. MEASUREMENT
A. Understand measurable attributes of objects and the units, systems, and processes of measurement
B. Apply appropriate techniques, tools, and formulas to determine measurement

6. PROBLEM SOLVING
A. Build new mathematical knowledge through problem solving
B. Solve problems that arise in mathematics and in other contexts
C. Apply and adapt a variety of appropriate strategies to solve problems
D. Monitor and reflect on the process of mathematical problem solving

8. COMMUNICATION
A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

9. CONNECTIONS
A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

10. REPRESENTATION
A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

PA MATH ASSESSMENT ANCHORS:

M11.D.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.

M11.D.2.1.2 Identify or graph functions, linear equations or linear inequalities on a coordinate plane.

M11.D.2.1.3 Write, solve and/or apply a linear equation (including problem situations).

M11.D.4.1.1 Match the graph of a given function to its table or equation.

UNIT OBJECTIVES:

1. Write the equation of a parabola.
2. Graph parabolas.
3. Write the equation of a circle.
4. Graph circles and identify the center and radius.
5. Write the equation of an ellipse.
6. Identify parts of an ellipse and graph an ellipse.

ACTIVITIES:

Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

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Grab & Go Chapter Support Files

Additional Activities:

1. Cross a Rabbit
2. Cross an Indian
3. Parabolas from Lines and Circles
4. Parabolic Reflectors
5. Parabolas
6. The Folded Rectangle
7. Pumped –up Pumpkin
8. Special Circles
9. What did the Russian…
10. Ellipses from Circles
11. What do you get if you divide…
12. Why did the cemetery worker…
13. Making Ellipses out of Circles
14. The Folded Circle
15. Conic Sections Classroom Activity

ASSESSMENTS:

- Observation and questioning
- Presentations and discussions
- Projects and investigations
- Mathematical writing
- Homework
- Quizzes
- Tests

REMEDIATION:

- Re-teaching Worksheets
- The Conic Section

Prentice Hall Algebra 2, 2007:
Hands-On Activities
Skill and Concept Review Masters
Online Video Tutor
MindPoint Quiz Show CD-ROM: End-of-Chapter reviews

ENRICHMENT:

- Hyperbolas from Circles
- Running Around in Circles
- Graphing Ellipses and Hyperbolas
- Where Does a Blackbird Go
- The Name of the Snake
- Famous Firsts
- Rectangular Hyperbolas
- A Famous Family

	Prentice Hall Math, 2007: Online Active Math: Built-in interactive explorations MindPoint Quiz Show CD-ROM Enrichment Masters PHSchool.com: Online support for Mathematics Web Codes within the textbook provide access to: • Vocabulary Quizzes • Chapter Tests • Chapter Projects • Math at Work **RESOURCES:** **Prentice Hall Algebra 2, 2007** PLATO Study Island NetTrekker United Streaming **WEB SITES** www.algebrahelp.com www.coolmath.com www.mathleague.com www.interactmath.com

Revised 10/07

COURSE: Topics in Applied Mathematics	GRADE(S): 12
UNIT 7: Data Analysis	TIME FRAME: 8 Days

NATIONAL STANDARDS: NCTM Standards

1. NUMBER AND OPERATIONS
A. Understand numbers, ways of representing numbers, relationships among numbers, and number systems
B. Understand meanings of operations and how they relate to one another
C. Compute fluently and make reasonable estimates

2. ALGEBRA
A. Understand patterns, relations, and functions
B. Represent and analyze mathematical situations and structures using algebraic symbols
C. Use mathematical models to represent and understand quantitative relationships
D. Analyze change in various contexts

3. GEOMETRY
C. Apply transformations and use symmetry to analyze mathematical situations
D. Use visualization, spatial reasoning, and geometric modeling to solve problems

4. MEASUREMENT
A. Understand measurable attributes of objects and the units, systems, and processes of measurement
B. Apply appropriate techniques, tools, and formulas to determine measurement

5. DATA ANALYSIS
A. Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them
B. Select and use appropriate statistical methods to analyze data
C. Develop and evaluate inferences and predictions that are based on data
D. Understand and apply basic concepts of probability

6. PROBLEM SOLVING
A. Build new mathematical knowledge through problem solving
B. Solve problems that arise in mathematics and in other contexts
C. Apply and adapt a variety of appropriate strategies to solve problems
D. Monitor and reflect on the process of mathematical problem solving

8. COMMUNICATION
A. Organize and consolidate their mathematical thinking through communication
B. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others
C. Analyze and evaluate the mathematical thinking and strategies of others
D. Use the language of mathematics to express mathematical ideas precisely

9. CONNECTIONS
A. Recognize and use connections among mathematical ideas
B. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole
C. Recognize and apply mathematics in contexts outside of mathematics

10. REPRESENTATION
A. Create and use representations to organize, record, and communicate mathematical ideas
B. Select, apply, and translate among mathematical representations to solve problems
C. Use representations to model and interpret physical, social, and mathematical phenomena

PA MATH ASSESSMENT ANCHORS:

M11.E.1.1.2 Analyze data and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots or scatter plots).

M11.E.2.1.1 Calculate or select the appropriate measure of central tendency (mean, mode or median) of a set of data given or represented on a table, line plot or stem-and-leaf plot.

M11.E.2.1.2 Calculate and/or interpret the range, quartiles and inter-quartile range of data.

M11.E.2.1.3 Describe how outliers affect measures of central tendency.

M11.E.3.1.1 Find probabilities for independent, dependent or compound events and represent as a fraction, decimal or percent.

M11.E.4.1.1 Estimate or calculate to make predictions based on a circle, line, bar graph or given situation.

M11.E.4.1.2 Use probability to predict outcomes.

UNIT OBJECTIVES:

1. Find the standard deviation of a set of values.
2. Use standard deviation in real-world situations.
3. Find sample proportions.
4. Find the margin of error.
5. Find binomial probabilities.
6. Use binomial distributions.
7. Use a normal distribution and the standard normal curve.

ACTIVITIES:

Teacher directed differentiated instructional projects and activities are ongoing and based on student need.

Prentice Hall Algebra 2, 2007:
All-in-One Student Workbook
Skill and Concept Review Masters
Grab & Go Chapter Support Files

Additional Activities:

1. Standard Deviation
2. Analyzing Polls
3. Practice 57
4. Counting Too Much on Luck
5. Lim Sing Problem Set
6. A die is rolled…
7. Find the Probability

http://www.shodor.org/interactivate/lessons/TheBellCurve/

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	ENRICHMENT: • Exploring Margin of Error • Polling a Population **Prentice Hall Math, 2007:** Online Active Math: Built-in interactive explorations MindPoint Quiz Show CD-ROM Enrichment Masters PHSchool.com: Online support for Mathematics Web Codes within the textbook provide access to: • Vocabulary Quizzes • Chapter Tests • Chapter Projects • Math at Work **RESOURCES:** **Prentice Hall Algebra 2, 2007** PLATO Study Island NetTrekker United Streaming **RESOURCES:** Algebra 2, Prentice Hall, 2007 **WEB SITES** www.algebrahelp.com www.coolmath.com www.mathleague.com www.interactmath.com