



PASSAIC COUNTY TECHNICAL INSTITUTE
45 Reinhardt Road
Wayne, NJ

Algebra II Curriculum
Course #: 0061, 0066, 0070
5 Credits
2018

I. Course Description

Building on the understanding of linear, quadratic, and exponential functions from Algebra I, this course will extend function concepts to include polynomial, rational, radical, logarithmic, and trigonometric functions. The standards in this course continue the work of modeling situations and solving equations.

II. Units

Unit 1

Content Area:	Algebra II	Grade(s)	9, 10, & 11
Unit Plan Title:	Unit I – Polynomials and Polynomial Functions		
	<i>Unit 1 will extend student’s algebraic knowledge of polynomials. Standards will continue with solving polynomial equations to include imaginary solutions and graphing polynomial functions, focusing on transformations of graphs. Solving and graphing quadratic inequalities as well as solving of systems of linear and quadratic functions will be included.</i>		
	0. Summer Packet Review (10 days)		
	I. Quadratic Functions (23 days)		
	1. Perform arithmetic operations with complex numbers. (3 days)		
	2. Solve quadratic equations by inspection. (4 days)		
	3. Graph and solve quadratic inequalities. (4 days)		
	4. Solve systems of linear and quadratic equations in two variables, algebraically and graphically. (4 days)		
	5. Graph and write equations of parabolas. (4 days)		
	6. Graph and write equations of circles. (4 days)		
NJSLS Standard(s) addressed in this semester			

- A.APR.A.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
- A.APR.B.2 Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a , the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.
- A.APR.B.3 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
- A.APR.C.5 Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n , where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.
- A.REI.B.4.b Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .
- A.REI.C.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
- A.REI.C.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. *For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.*
- G.GPE.A.1 Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
- G.GPE.A.2 Derive the equation of a parabola given a focus and directrix.
- N.CN.A.1 Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.
- N.CN.A.2 Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.

Essential Questions (3-5)

1. How is any quadratic function related to the parent quadratic function $f(x) = x^2$?
2. What is the process to find all complex zeros of a quadratic function?
3. How are the real solutions of a quadratic equation related to the graph of the related quadratic function?
4. How are quadratic functions used to model, analyze and interpret mathematical relationships?

Anchor Text

Algebra II Larson, Common Core Edition

Authors : Ron Larson

Houghton Mifflin Harcourt

Copyrite Date: 2012

ISBN: 978-0-547-64715-9

Algebra II Burger, Common Core Edition

Authors : Burger

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Informational Texts (3-5)

Short Texts (1-3)

Formative & Summative Assessments

Formative Assessment

- Homework
- Quiz
- Chapter test
- Classwork

Summative Assessment

- Semester Pretest
- Semester Posttest
- Project
- Final Exam

Resources (websites, Canvas, LMS, Google Classroom, documents, etc.)

TI 84 Plus Calculator

TI Nspire Graphing Calculator

Excel

Canvas

Google Classroom

<https://www.khanacademy.org/math/algebra2>

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Suggested Time Frame:

33 Days

Unit 2

Content Area:	Algebra II	Grade(s)	9, 10, & 11
Unit Plan Title:	Unit 2 – Polynomials and Polynomial Functions <i>Unit 2 will extend student’s algebraic knowledge of polynomials. Standards will continue with solving polynomial equations to include imaginary solutions and graphing polynomial functions, focusing on transformations of graphs.</i> II. Polynomial Functions (27 days) <ol style="list-style-type: none">1. Add, subtract, and multiply polynomials. (4 days)2. Apply the Binomial Theorem. (2 days)3. Factoring and solve polynomial equations. (4 days)4. Apply the Remainder and Factor Theorems. (4 days)5. Find rational zeros. (4 days)6. Apply the Fundamental Theorem of Algebra. (4 days)7. Analyze and graph polynomial functions. (5 days)		
NJSLS Standard(s) addressed in this semester			
A.APR.A.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.			
A.APR.B.2 Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a , the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.			
A.APR.B.3 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.			
A.APR.C.5 Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n , where x			

- and y are any numbers, with coefficients determined for example by Pascal's Triangle.
- A.SSE.A.2 Use the structure of an expression to identify ways to rewrite it.
 - F.IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
 - N.CN.C.7 Solve quadratic equations with real coefficients that have complex solutions.
 - N.CN.C.9 Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.

Essential Questions (3-5)

1. What are the characteristics of a polynomial function?
2. What is the process to find all complex zeros of a polynomial function?
3. What are the Factor and Rational Root Theorems?
4. What is the realistic domain of a polynomial application?

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Suggested Time Frame:

27 Days

Unit 3

Content Area:	Algebra II	Grade(s)	9, 10, & 11
Unit Plan Title:	Unit 3 – Rational Exponents and Radical Functions <i>Unit 3 will extend student’s algebraic knowledge of radical functions. The graphs of all these functions will be modeled and their transformations will be analyzed. The use of rational exponents, performing function operations which includes composition of functions, and finding inverse functions will also be investigated.</i> III. Rational Exponents and Radical Functions (18 days) <ol style="list-style-type: none">1. Evaluate nth roots and use rational exponents. (2 days)2. Apply properties of rational exponents. (3 days)3. Perform function operations and composition. (3 days)4. Determine the inverse function for a simple function. (3 days)5. Graph square root function and cube root functions. (3 days)6. Solve radical equations. (4 days)		
NJSLS Standard(s) Addressed in this unit			
A.REI.A.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. F.BF.A.1b Combine standard function types using arithmetic operations. F.BF.A.1c Compose functions. F.BF.B.4a Solve an equation of the form $f(x) = cf$ or a simple function f that has an inverse and write an expression for the inverse. F.IF.C.7b Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. N.RN.A.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. N.RN.A.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.			
Essential Questions (3-5)			
<ol style="list-style-type: none">1. How are rational exponents related to radicals and roots?2. How do you convert radical expressions to expressions with rational exponents?3. How do you solve radical equations?4. How can real number operations be extended to radical expression and equations?			

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Suggested Time Frame:

18 Days

Unit 4

Content Area:	Algebra II	Grade(s)	9, 10, & 11
Unit Plan Title:	Unit 4 – Exponential and Logarithmic Functions		
	<p><i>In Unit 4, the student will understand the relationship between exponential and logarithmic functions. The graphs of all these functions will be modeled and their transformations will be analyzed. By applying the properties of exponents and logarithms, the student will be able to solve exponential and logarithmic equations. How these functions are used to study many naturally occurring phenomena will also be included.</i></p>		
	<p>IV. Exponential and Logarithmic Functions (20 days)</p> <ol style="list-style-type: none">1. Graph exponential growth functions. (3 days)2. Graph exponential decay functions. (3 days)3. Use functions involving e. (3 days)4. Evaluate logarithms and graph logarithmic functions. (3 days)5. Apply properties of logarithms. (2 days)6. Solve exponential and logarithmic equations. (4 days)7. Write and apply exponential and power functions. (2 days)		
NJSLS Standard(s) Addressed in this unit			
F.BF.B.5	Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents		
F.IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.		
F.IF.C.7e	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		
F.LE.A.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).		
F.LE.A.4	Understand the inverse relationship between exponents and logarithms. For exponential models, express as a logarithm the solution to $abct = d$ where a , c , and d are numbers and the base b is 2, 10, or e ; evaluate the logarithm using technology.		

Essential Questions (3-5)

1. What are real world models of exponential growth and decay?
2. How do you use the properties of exponents to simplify logarithmic expressions and solve logarithmic equations?
3. How are exponents and logarithms related?
4. How do you use logarithms to solve exponential equations?

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Suggested Time Frame:

20 Days

Unit 5

Content Area:	Algebra II	Grade(s)	9, 10, & 11
Unit Plan Title:	Unit 5 – Rational Functions <i>Unit 5 will introduce rational functions as functions that can be written as quotients of two polynomial functions. The graphs of all these functions will be modeled and their transformations will be analyzed. Students will simplify rational expressions to lowest terms and perform arithmetic operations with them, in preparation for solving rational equations.</i> V. Rational Functions (22 days) <ol style="list-style-type: none">1. Graph simple rational functions. (3 days)2. Graph general rational functions. (4 days)3. Multiply and divide rational expressions. (4 days)4. Add and subtract rational expressions. (4 days)5. Solve rational equations. (5 days)6. Describe and compare function characteristics. (2 days)		
NJSLS Standard(s) Addressed in this unit			
A.APR.D.7 Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.			
A.REI.A.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.			
FIF.C.7d Graph rational function, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.			
F.IF.C.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).			
Essential Questions (3-5)			
<ol style="list-style-type: none">1. How can you graph rational functions?2. How can you solve rational equations?3. What kinds of asymptotes may exist in rational functions and why?4. Why do rational expressions need to have a defined domain?			

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Suggested Time Frame:

22 Days

Unit 6

Content Area:	Algebra II	Grade(s)	9, 10, & 11
Unit Plan Title:	Unit 6 – Trigonometric Ratios and Functions (27 days) <i>Unit 6 standards will build on the students' previous knowledge of functions, trigonometric ratios and circles in geometry to extend trigonometry to model periodic phenomena.</i> VI. Trigonometric Ratios and Functions (27 days) <ol style="list-style-type: none">1. Use trigonometry with right triangles. (4 days)2. Define general angles and use radian measure. (5 days)3. Evaluate trigonometric functions of any angle. (5 days)4. Evaluate inverse trigonometric functions. (5days)5. Apply the Law of Sines. (4 days)6. Apply the Law of Cosines. (4 days)		
NJSLS Standard(s) Addressed in this unit			
F.TF.A.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.		
F.TF.A.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.		
F.TF.B.6	Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.		
G.SRT.C.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangles, leading to definitions of trigonometric ratios for acute angles.		
G.SRT.D.11	Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).		
Essential Questions (3-5)			
1. What is the definition of the six basic trigonometric functions in terms of the sides of a right triangle?			
2. What is the definition of a radian?			
3. What is the Unit Circle?			
4. What is the main difference between a trigonometric function and its inverse?			
5. How can you solve triangles using the Law of Sines and Cosines?			

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Suggested Time Frame:

27 Days

Unit 7

Content Area:	Algebra II	Grade(s)	9, 10, & 11
Unit Plan Title:	Unit 7 – Trigonometric Graphs, Identities, and Equations <i>Unit 7 standards will continue with analyzation of periodic graphs, trigonometric identities, and solving of trigonometric equations. Finding the function value of special angles by applying the Double and Half-angle formulas will also be investigated .</i> VII. Trigonometric Graphs, Identities, and Equations (33 days) <ol style="list-style-type: none">1. Graph sine, cosine, and tangent functions. (9 days)2. Translate and reflect trigonometric graphs. (6 days)3. Verify trigonometric identities. (5 days)4. Solve trigonometric equations. (5 days)5. Write trigonometric functions and models. (2 days)6. Apply Sum and Difference Formulas. (3 days)7. Apply Double-Angle and Half-Angle Formulas. (3 days)		
NJSLS Standard(s) Addressed in this unit			
F.IF.C.7e Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions,			
F.TF.B.5 Choose trigonometric functions to model periodic phenomena with specific amplitude, frequency, and midline.			
F.TF.B.7 Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.			
F.TF.C.8 Prove the Pythagorean identity $\sin^2\theta + \cos^2\theta = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.			
F.TF.C.9 Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.			
Essential Questions (3-5)			
1. What are the Pythagorean, ratio, and reciprocal identities?			

2. What approaches can be used to verify a trigonometric identity?
3. How does the unit circle and the concept of conterminal angles help us to generate graphs of trigonometric functions?
4. What does it mean to solve a trigonometric equation?

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Suggested Time Frame:

33 Days

II. Instructional Strategies

- Lecture
- Graphs and other visuals
- Student investigative activities
- Engaging in discussions
- Reading silently and aloud
- Brainstorming
- Listening
- Participating in small and large groups
- Collaborative projects
- Answering questions (oral and written)
- Summarizing
- Debating
- Analyzing data, discussions, etc.
- Peer teaching
- Playing games
- Note taking
- Writing

Differentiated Instruction

- Students will work individually, engage in cooperative learning, and utilize discovery learning on certain activities. Through the use of lectures, the internet, and interactive whiteboards, students will be exposed to various teaching methods to appeal to visual, auditory, and kinesthetic learners. Students will be given copies of data sets and other important notes.

IV. Methods of Student Evaluation

Assessment can be divided into two general categories: formal (graded) and informal/classroom-based (both graded and ungraded). The key to effectively assessing a student's mastery of skills is to match the assessment method to the learning objective.

Formal Assessments

- Homework and classwork assignments
- Reports and presentations
- Technological applications
- Multiple choice assessment
- Quizzes
- Projects
- Short answer and problem solving assessment
- Tests
- Investigative task

Informal Assessments

- Instructor's observations of note-taking, and organization of notebooks and assignments

- Class Participation
- Cooperative learning activities
- Observing citizenship and appropriate social responses
- Instructor’s observations of time management skills

V. Scope and Sequence

Key: I – Introduced, D-developed in Depth, R-Reinforced

Skill/Concepts to be Learned	9	10	11
Perform operations with complex numbers.	IDR	IDR	IDR
Solve quadratic equations using a variety of methods	DR	DR	DR
Graph and solve quadratic inequalities.	IDR	IDR	IDR
Solve systems of linear and quadratic equations in two variables, algebraically and graphically.	DR	DR	DR
Graph and write equations for parabolas.	DR	DR	DR
Graph and write equations for circles.	DR	DR	DR
Graph polynomial functions.	IDR	IDR	IDR
Perform operations with polynomials.	DR	DR	DR

Apply the Binomial Theorem.	IDR	IDR	IDR
Solve polynomial equations and find zeros.	IDR	IDR	IDR
Use rational exponents.	IDR	IDR	IDR
Perform function operations and composition.	IDR	IDR	IDR
Find inverse functions.	IDR	IDR	IDR
Graph radical functions.	IDR	IDR	IDR
Solve radical equations.	IDR	IDR	IDR
Graph exponential and logarithmic functions.	IDR	IDR	IDR
Apply properties of logarithms.	IDR	IDR	IDR
Solve exponential and logarithmic equations.	IDR	IDR	IDR
Write and apply exponential and power functions.	IDR	IDR	IDR
Graph rational functions.	IDR	IDR	IDR
Perform operations with rational expressions.	IDR	IDR	IDR
Solve rational equations.	IDR	IDR	IDR
Describe and compare function characteristics.	IDR	IDR	IDR
Use trigonometric functions to find side length and angle measure.	DR	DR	DR
Define general angles and use radian measure.	DR	DR	DR
Evaluate trigonometric functions of any angle.	IDR	IDR	IDR
Evaluate inverse trigonometric functions	IDR	IDR	IDR
Apply the Law of Sines and Law of Cosines	IDR	IDR	IDR

Graph trigonometric functions.	IDR	IDR	IDR
Verify trigonometric identities.	IDR	IDR	IDR
Solve trigonometric equations.	IDR	IDR	IDR
Apply trigonometric special angle formulas.	IDR	IDR	IDR
Write trigonometric functions and models.	IDR	IDR	IDR

VI. Textbooks, Instructional Resources and Software

Algebra II Larson, Common Core Edition Authors : Ron Larson and Algebra II Burger, Common Core Edition Authors : Burger

Resources for Students	Resources for Teachers
<p>Digital Companion website: https://my.hrw.com/</p> <p>Practice and Resources</p> <ul style="list-style-type: none"> • Interactive Practice Test • Chapter Review Games • Chapter Project • Measurement and Data Handbook • Multi-Language Visual Glossary • Interactive Practice Quiz • Problem Solving Workshop • Study Guide • Investigating Geometry Activity • Real-Life Application 	<p>Digital Companion website: https://my.hrw.com/</p> <p>Resources</p> <ul style="list-style-type: none"> • Lesson Plans • Teaching Guide • Solutions Key • Quick Catch-Up for Absent Students • Lesson Transparencies • PowerPoint Presentations • Study Guide • Tiered Student Practice • Chapter Project: Answers and Teacher’s Notes <p>Assessment Resources</p> <ul style="list-style-type: none"> • Quizzes, Chapter Tests • Standardized Chapter Test • SAT/ACT Chapter Test

<p>Internet Resources</p> <ul style="list-style-type: none"> • Multilingual Glossary • Graphing Calculator • Scientific Calculator • Online Student Edition <p>Print</p> <p>Student Edition ISBN: 978-0-547-64714-2</p>	<ul style="list-style-type: none"> • Alternative Assessment • Cumulative Test • End-of-Course Test • Remediation Book • Skills Readiness <p>Internet Resources</p> <ul style="list-style-type: none"> • Multilingual Glossary • Graphing/Scientific Calculator • Online Teacher Edition <p>Print</p> <p>Annotated Instructor’s Edition ISBN: 978-0-547-64708-1</p>
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VII. Algebra II Curriculum Correlation Chart with Textbook

Algebra II Topic	Corresponding Text Sections	
	Larson Book	Burger Book
I. Quadratic Functions		
1. Perform arithmetic operations with complex numbers	1.6	2.9
2. Solve quadratic equations	1.7, 1.8	2.3, 2.4, 2.6
3. Graph and solve quadratic inequalities	1.9	2.7
4. Solve systems of linear and quadratic equation in two variables, algebraically and graphically	8.7	12.7
5. Graph and write equations of parabolas	8.2	12.5
6. Graph and write equations of circles	8.3	12.2
II. Polynomial Functions		
1. Perform arithmetic operations with polynomials	2.3	3.1, 3.2
2. Apply the Binomial Theorem	6.1	8.6
3. Apply Remainder and Factor Theorems	2.5	3.3, 3.4
4. Factor polynomials	2.4	3.4

5. Find rational zeros	2.6	3.5
6. Apply the Fundamental Theorem of Algebra	2.7	3.6
7. Interpret key features of polynomial graphs	2.2, 2.8	3.7
III. Rational Exponents and Radical Functions		
1. Evaluate nth roots and use rational exponents	3.1	5.6
2. Apply properties of rational exponents	3.2	5.6
3. Perform function operations and composition	3.3	6.5
4. Determine the inverse function for a simple function	3.4	6.6
5. Graph square root function and cube root function	3.5	5.7
6. Solve radical equations	3.6	5.8
IV. Exponential and Logarithmic Functions		
1. Graph exponential growth functions	4.1	4.1
2. Graph exponential decay functions	4.2	4.1
3. Use functions involving e	4.3	4.6
4. Evaluate logarithms and graph logarithmic function	4.4	4.3, 4.7
5. Apply Properties of Logarithms	4.5	4.4
6. Solve Exponential and Logarithmic Equations	4.6	4.5, 4.6
7. Write and apply exponential and power functions	4.7	4.8
V. Rational Functions		
1. Graph simple rational functions	5.2	5.4
2. Graph general rational functions	5.3	5.4
3. Multiply and divide rational expressions	5.4	5.2
4. Add and subtract rational expressions	5.5	5.3
5. Solve rational equations	5.6	5.5
6. Describe and compare function characteristics	5.7	6.1, 6.2
VI. Trigonometric Ratios and Functions		
1. Use trigonometry with right triangles	9.1	10.1
2. Define general angles and use radian measure	9.2	10.2
3. Evaluate trigonometric functions of any angle	9.3	10.3
4. Evaluate inverse trigonometric functions	9.4	10.4
5. Apply the Law of Sines	9.5	10.5
6. Apply the Law of Cosines	9.6	10.6
VII. Trigonometric Graphs, Identities, and Equations		
1. Graph sine, cosine, and tangent functions	10.1	11.1
2. Translate and reflect trigonometric graph	10.2	11.2

3. Verify trigonometric identities	10.3	11.3
4. Solve trigonometric equations	10.4	11.6
5. Write trigonometric functions and models	10.5	Not applicable
6. Apply Sum and Difference Formulas	10.6	11.4
7. Apply Double-Angle and Half-Angle Formulas	10.7	11.5

VIII. Student Handout

Algebra II Course Overview

Building on the understanding of linear, quadratic, and exponential functions from Algebra I, this course will extend function concepts to include polynomial, rational, radical, logarithmic, and trigonometric functions. The standards in this course continue the work of modeling situations and solving equations.

Proficiencies

I. Quadratic Functions

- Perform operations with complex numbers.
- Solve quadratic equations using a variety of methods
- Graph and solve quadratic inequalities.
- Solve systems of linear and quadratic equations in two variables, algebraically and graphically.
- Graph and write equations for parabolas.
- Graph and write equations for circles.

II. Polynomial Functions

- Graph polynomial functions.
- Perform operations with polynomials.
- Apply the Binomial Theorem.
- Solve polynomial equations and find zeros.

III. Rational Exponents and Radical Functions

- Use rational exponents.
- Perform function operations and composition.
- Find inverse functions.
- Graph radical functions.
- Solve radical equations.

IV. Exponential and Logarithmic Functions

- Graph exponential and logarithmic functions.
- Apply properties of logarithms.
- Solve exponential and logarithmic equations.
- Write and apply exponential and power functions.

V. Rational Functions

- Graph rational functions.
- Perform operations with rational expressions.
- Solve rational equations.
- Describe and compare function characteristics.

VI. Trigonometric Ratios and Functions

- Use trigonometric functions to find side length and angle measure.
- Define general angles and use radian measure.
- Evaluate trigonometric functions of any angle.
- Evaluate inverse trigonometric functions.
- Apply the Law of Sines and Law of Cosines.

VII. Trigonometric Graphs, Identities, and Equations

- Graph trigonometric functions.
- Verify trigonometric identities.

- Solve trigonometric equations.
- Apply trigonometric special angle formulas.
- Write trigonometric functions and models.