**Algebra 2 Standard**

**Instructional Plan 2014-2015**

**Mathematics Instructional Plan Writing Committee**

|  |  |  |  |  |  |  |  |
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We would like to express our appreciation for the time, effort and expertise contributed to the writing of the secondary Mathematics Instructional Plans by our team of Seminole County math teachers.

**Purpose:**

The purpose of the Seminole County Public Schools Instructional Plan is to present an organized, responsible strategy of Benchmark presentation that incorporates Next Generation Sunshine State Standards (NGSSS) while using the Springboard Course 1 Textbook. This document will serve as a guide for teachers of mathematics. Latitude in the execution of this document shall be determined by a school rather than by an individual teacher.

**Goals:**

* To establish a classroom environment that values mathematical student discourse
* To engage students in cognitively challenging mathematical tasks
* To promote discussions that focus on student thinking, reasoning, problem solving and student presentation
* To build on student thinking while ensuring the discussion remains focused on the mathematical ideas of the lesson
* Employ questioning techniques that require students to justify, defend and support their ideas

**Instructional Plan Caveats:**

* Suggested practice corresponds to the associated lesson and left at the discretion of the instructor to be used as additional practice or assignment. Problems within the suggested pages may be exhausted or selected for targeted skills.
* Descriptions of the Mathematical Practices can be found on pages 3 – 4. Teachers are encouraged to embed the Questions to Develop Mathematical Thinking on pages 5 – 6 in their daily lessons.
* **Each unit will include at least one learning goal listed under the unit heading. These are suggested learning goals and scales that teachers can use when implementing learning scales in their classes. The learning goals correspond to the grade/level specific clusters as defined by the MAFS.**
* **The learning goals and scales are a work in progress and may be modified as needed. They are meant to be a starting point for PLCs to use as they customize the learning goals and scales to best demonstrate student learning.**

**Test Items Specifications:** [fsassessments.org](http://fsassessments.org/)

**STANDARDS FOR MATHEMATICAL PRACTICE**

1. **(MAFS.K12.MP.1.1): Make sense of problems and persevere in solving them.**

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

**2. (MAFS.K12.MP.2.1): Reason abstractly and quantitatively.**

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

**3. (MAFS.K12.MP.3.1): Construct viable arguments and critique the reasoning of others.**

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

**4. (MAFS.K12.MP.4.1): Model with mathematics.**

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

**5. (MAFS.K12.MP.5.1): Use appropriate tools strategically.**

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

**6. (MAFS.K12.MP.6.1): Attend to precision.**

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, student’s give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

**7. (MAFS.K12.MP.7.1): Look for and make use of structure.**

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7 × 8 equals the well-remembered 7 × 5 + 7 × 3, in preparation for learning about the distributive property. In the expression *x*2 + 9*x* + 14, older students can see the 14 as 2 × 7 and the 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see 5 – 3(*x* – *y*) 2 as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers *x* and *y*.

**8. (MAFS.K12.MP.8.1): Look for and express regularity in repeated reasoning.**

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation (*y* – 2)/(*x* – 1) = 3. Noticing the regularity in the way terms cancel when expanding (*x* – 1)(*x* + 1), (*x* – 1)(*x*2 + *x* + 1), and (*x* – 1)(*x*3 + *x*2 + *x* + 1) might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

| **Summary of Standards for Mathematical Practice** | **Questions to Develop Mathematical Thinking** |
| --- | --- |
| **1. Make sense of problems and persevere in solving them.** | |
| * Interpret and make meaning of the problem to find a starting point. Analyze what is given in order to explain to them the meaning of the problem. * Plan a solution pathway instead of jumping to a solution. * Monitor their progress and change the approach if necessary. * See relationships between various representations. * Relate current situations to concepts or skills previously learned and connect mathematical ideas to one another. * Continually ask them, “Does this make sense?” Can understand various approaches to solutions. | * How would you describe the problem in your own words? * How would you describe what you are trying to find? * What do you notice about...? * What information is given in the problem? * Describe the relationship between the quantities. * Describe what you have already tried. What might you change? * Talk me through the steps you’ve used to this point. * What steps in the process are you most confident about? * What are some other strategies you might try? * What are some other problems that are similar to this one? * How might you use one of your previous problems to help you begin? * How else might you organize...represent... show...? |
| **2. Reason abstractly and quantitatively.** | |
| * Make sense of quantities and their relationships. * Decontextualize (represent a situation symbolically and manipulate the symbols) and contextualize (make meaning of the symbols in a problem) quantitative relationships. * Understand the meaning of quantities and are flexible in the use of operations and their properties. * Create a logical representation of the problem. * Attends to the meaning of quantities, not just how to compute them. | * What do the numbers used in the problem represent? * What is the relationship of the quantities? * How is \_\_\_\_\_\_\_ related to \_\_\_\_\_\_\_\_? * What is the relationship between \_\_\_\_\_\_and \_\_\_\_\_\_? * What does\_\_\_\_\_\_\_mean to you? (e.g. symbol, quantity, diagram) * What properties might we use to find a solution? * How did you decide in this task that you needed to use...? * Could we have used another operation or property to solve this task? Why or why not? |
| **3. Construct viable arguments and critique the reasoning of others.** | |
| * Analyze problems and use stated mathematical assumptions, definitions, and established results in constructing arguments. * Justify conclusions with mathematical ideas. * Listen to the arguments of others and ask useful questions to determine if an argument makes sense. * Ask clarifying questions or suggest ideas to improve/revise the argument. * Compare two arguments and determine correct or flawed logic. | * What mathematical evidence would support your solution? * How can we be sure that...? / How could you prove that...? * Will it still work if...? * What were you considering when...? * How did you decide to try that strategy? * How did you test whether your approach worked? * How did you decide what the problem was asking you to find? (What was unknown?) * Did you try a method that did not work? Why didn’t it work? Would it ever work? Why or why not? * What is the same and what is different about...? * How could you demonstrate a counter-example? |
| **4. Model with mathematics.** | |
| * Understand this is a way to reason quantitatively and abstractly (able to decontextualize and contextualize). * Apply the mathematics they know to solve everyday problems. * Are able to simplify a complex problem and identify important quantities to look at relationships. * Represent mathematics to describe a situation either with an equation or a diagram and interpret the results of a mathematical situation. * Reflect on whether the results make sense, possibly improving/revising the model. * Ask them, “How can I represent this mathematically?” | * What number model could you construct to represent the problem? * What are some ways to represent the quantities? * What is an equation or expression that matches the diagram, number line..., chart..., table..? * Where did you see one of the quantities in the task in your equation or expression? * How would it help to create a diagram, graph, and table...? * What are some ways to visually represent...? * What formula might apply in this situation? |

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| **5. Use appropriate tools strategically.** | |
| * Use available tools recognizing the strengths and limitations of each Unit * Use estimation and other mathematical knowledge to detect possible errors. * Identify relevant external mathematical resources to pose and solve problems. * Use technological tools to deepen their understanding of mathematics. | * What mathematical tools could we use to visualize and represent the situation? * What information do you have? * What do you know that is not stated in the problem? * What approach are you considering trying first? * What estimate did you make for the solution? * In this situation would it be helpful to use...a graph..., number line..., ruler..., diagram..., calculator..., manipulative? * Why was it helpful to use...? * What can using a \_\_\_\_\_\_ show us that \_\_\_\_\_may not? * In what situations might it be more informative or helpful to use...? |
| **6. Attend to precision.** | |
| * Communicate precisely with others and try to use clear mathematical language when discussing their reasoning. * Understand the meanings of symbols used in mathematics and can label quantities appropriately. * Express numerical answers with a degree of precision appropriate for the problem context. * Calculate efficiently and accurately. | * What mathematical terms apply in this situation? * How did you know your solution was reasonable? * Explain how you might show that your solution answers the problem. * What would be a more efficient strategy? * How are you showing the meaning of the quantities? * What symbols or mathematical notations are important in this problem? * What mathematical language...,definitions..., properties can you use to explain...? * How could you test your solution to see if it answers the problem? |
| **7. Look for and make use of structure.** | |
| * Apply general mathematical rules to specific situations. * Look for the overall structure and patterns in mathematics. * See complicated things as single objects or as being composed of several objects. | * What observations do you make about...? * What do you notice when...? * What parts of the problem might you eliminate.., simplify..? * What patterns do you find in...? * How do you know if something is a pattern? * What ideas that we have learned before were useful in solving this problem? * What are some other problems that are similar to this one? * How does this relate to...? * In what ways does this problem connect to other mathematical concepts? |
| **8. Look for and express regularity in repeated reasoning.** | |
| * See repeated calculations and look for generalizations and shortcuts. * See the overall process of the problem and still attend to the details. * Understand the broader application of patterns and see the structure in similar situations. * Continually evaluate the reasonableness of their intermediate results | * Explain how this strategy works in other situations? * Is this always true, sometimes true or never true? * How would we prove that...? * What do you notice about...? * What is happening in this situation? * What would happen if...? * Is there a mathematical rule for...? * What predictions or generalizations can this pattern support? * What mathematical consistencies do you notice? |

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| **FIRST QUARTER (August 11 – October 9)** | | **42 DAYS** |
| **Topic/Assessment** | **Dates Covered** | **Topic/Assessment** |
| Unit 1: Linear and Quadratic Functions (Chapter 1, 2, 4, 10) |  | 14 |
| Unit 2: Quadratic Functions and Equations (Chapter 4) |  | 12 |
| Unit 3: Polynomial Functions and Equations (Chapter 5) |  | 13 |
| District Assessment (1 day), 9 Weeks Exams (2 days) |  | 3 |
|  | | |
| **SECOND QUARTER (October 13 – December 18)** | | **46 DAYS** |
| **Topic/Assessment** | **Dates Covered** | **Topic/Assessment** |
| Unit 4: Radical Expressions (Chapter 6) |  | 14 |
| Unit 5: Radical Functions and Equations (Chapter 6) |  | 8 |
| Unit 6: Sequence and Series (Chapter 9) |  | 8 |
| Unit 7: Exponential Functions and Equations (Chapter 7) |  | 11 |
| District Assessment (1 day); PSAT (1); 9 Weeks Exams (3 days) |  | 5 |
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| **THIRD QUARTER (January 6 – March 12)** | | **46 DAYS** |
| **Topic/Assessment** | **Dates Covered** | **Topic/Assessment** |
| Unit 8: Rational Functions and Equations (Chapter 8) |  | 17 |
| Unit 9: Probability |  | 9 |
| Unit 10: Statistics |  | 16 |
| District Assessment (1 day); FSA/PLA Writing (1 day); 9 Weeks Exams (2 days) |  | 4 |
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| **FOURTH QUARTER (March 23 – May 27)** | | **46 DAYS** |
| **Topic/Assessment** | **Dates Covered** | **Topic/Assessment** |
| Unit 11: Trigonometric Functions |  | 12 |
| Unit 12: Linear and Nonlinear Systems of Equations (Chapter 3) |  | 8 |
| Unit 13: Trigonometric Functions Part 2 (Post EOC) |  | 16 |
| FSA Review/Tests (7 days); 9 Weeks Exams (3 days) |  | 10 |

*\*Please note that the suggested number of instructional days per unit and quarter are designed to be a guide. Teachers are encouraged to work within their schools and their PLCs to make the most appropriate timing decisions for their students.\**

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| **Unit 1: Linear and Quadratic Functions** | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | **SMP** |
| [A-CED.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5555) | Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. | | | | | 3, 8 |
| [A-CED.1.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5557) | Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm’s law V = IR to highlight resistance R.* | | | | | 2,3 |
| [A-CED.1.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5556) | Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods. | | | | | 1, 3 |
| [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574) | Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* | | | | | 2, 4, 6 |
| [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573) | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* | | | | | 2, 5, 6 |
| [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576) | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.   1. Graph linear and quadratic functions and show intercepts, maxima, and minima. 2. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. 3. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. 4. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. 5. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude, and using phase shift. | | | | | 3, 4, 5 |
| [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578) | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)*. For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* | | | | | 1, 2 |
| [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581) | Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.* | | | | | 2, 3, 5 |
| [G-GPE.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5628) | Derive the equation of a parabola given a focus and directrix. | | | | |  |
| [N-Q.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5520) | Define appropriate quantities for the purpose of descriptive modeling. | | | | |  |
| **Learning Goal and Scale** | | | **Instructional Strategies & Misconceptions** | | | |
| [**A202:** Create equations that represent real-world mathematical relationships, including constraints and literal equations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_02.docx)  [**A208:** Interpret functions that arise in real-world context, including restricting domain/range, and interpreting average rate of change.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_08.docx)  [**A209:** Graph and write equivalent forms of functions by hand and using technology, and compare functions in different representations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_09.docx) | | | Common Errors with Variables pg. 3A; Common Errors with Solving Equations pg. 3B Common Errors with Absolute Value pg. 3B The students sometimes confuse absolute value with “opposite.” Point out that opposite of a positive number is not the same as its absolute value. Common Errors with Functions pg. 63A Errors in determining whether a relation is a function can occur when students do not fully understand the definition of a function as well as the meaning of domain and range. Multiple representations of the same example may help students. Show that an equation can be graphed and that the graph is made up of ordered pairs or a table. Errors also occur in evaluating functions when f(x) notation is first introduced. Some students can evaluate y=4x+1 for x=2, but struggle f(2) if f(x)=4x+1. Provide multiple examples. Common Errors with Graphing Calculators pg. 63B Graphing calculator errors can happen when students do not remember the steps involved. Make a sheet of instructions available until students are comfortable with steps.  Common Errors with Transformations pg. 63B  Common Errors when Describing and Graphing Quadratic Functions pg. 203A Students often rely on graphing calculators and do not use information from the equation to visualize the graph.  Common Errors when Finding Zeros of Quadratic Functions pg. 203B Mistakes may occur when students use graphing calculators to solve the quadratic formula because they fail to use parentheses correctly. | | | |
| **Math Practices for Unit** | | | **Unit Connections** | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Solving linear equations * Solving absolute value inequalities * Writing and graphing equations in slope-intercept form * Identify translations * Solving systems of equations |  |  | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **FIRST QUARTER** | | | | | | |
| **Unit 1: Linear and Quadratic Functions** | | | | | | |
| **Learning Goal** | [**A202:** Create equations that represent real-world mathematical relationships, including constraints and literal equations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_02.docx)  [**A208:** Interpret functions that arise in real-world context, including restricting domain/range, and interpreting average rate of change.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_08.docx)  [**A209:** Graph and write equivalent forms of functions by hand and using technology, and compare functions in different representations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_09.docx) | | | | **Suggested # of Days** | **14** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| **For this unit, in order to address standard F-IF.3.9, students should be exposed to piecewise, absolute value, and quadratic functions in various forms and asked to discuss similarities and differences of the key features presented in this unit.** | | | | | | |
| 1 | [N-Q.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5520)  A-CED.1.1  A-CED.1.2  A-CED.1.3  [A-CED.1.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5557) | 1.4: Solving Equations (Literal Equations Only) | Pg. 31 - #20, 22, 27-29, 35 |  | | |
| 2 | [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578) | Concept Byte: Piecewise Functions (Pg. 90)  (include domain, range, interval notation) | 20-HW. Piecewise Functions.pdf | [19-Notes. Piecewise Functions.pdf](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/19-notes._piecewise_functions.pdf) | | |
| 2 | [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581)  [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573)  [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574) | 2.7: Absolute Value Functions and Their Graphs (With Transformations)  (include domain, range, interval notation) | Pg. 125 - #24-28, 36, 37 |  | | |
| 2 | [G-GPE.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5628) | 10.2: Derive a Parabola Using a Directrix and a Focus (Include ones where the vertex is not located at the origin). |  | [Writing Parabolic Equations Worksheet](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/parabolas_7-1_sgi_pc.docx) | | |
| 3 | [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581)  [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573)  [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574) | 4.1: Quadratic Functions and Transformations (include domain, range, interval notation) | Pg. 210 - #27, 28, 30, 41, 42 |  | | |
| 2 | [A-SSE.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5544) | 4.4: Factoring Quadratic Expressions | Pg. 230 - #35, 38, 39  Pg. 235 - #42, 43 |  | | |
| 2 |  | Review and Assessment |  |  | | |

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| **Unit 2: Quadratic Functions and Equations** | | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | | **SMP** |
| [A-REI.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5561) | Solve quadratic equations in one variable.   1. Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)² = q that has the same solutions. Derive the quadratic formula from this form. 2. Solve quadratic equations by inspection (e.g., for x² = 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 ± bi* for real numbers a and b. | | | | | | 3,6,8 |
| [N-CN.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5522) | Know there is a complex number i such that i² = –1, and every complex number has the form a + bi with a and b real. | | | | | | 1, 2 |
| [N-CN.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5523) | Use the relation i² = –1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. | | | | | | 2, 3, 8 |
| [N-CN.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5528) | Solve quadratic equations with real coefficients that have complex solutions. | | | | | | 2, 6 |
| [A-SSE.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5545) | Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.   1. Factor a quadratic expression to reveal the zeros of the function it defines. 2. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. 3. Use the properties of exponents to transform expressions for exponential functions. *For example the expression http://www.cpalms.org/Uploads/Benchmark/5545/img/Capture1.PNG can be rewritten as http://www.cpalms.org/Uploads/Benchmark/5545/img/Capture2.PNG ≈ http://www.cpalms.org/Uploads/Benchmark/5545/img/Capture3.PNG to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.* | | | | | | 1,3 |
| [F-IF.3.8](http://www.cpalms.org/Public/PreviewStandard/Preview/5577) | Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.   1. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. 2. Use the properties of exponents to interpret expressions for exponential functions. *For example, identify percent rate of change in functions such as y = http://www.cpalms.org/Uploads/Benchmark/5577/img/Capture.PNG, y = http://www.cpalms.org/Uploads/Benchmark/5577/img/Capture1.PNG, y = http://www.cpalms.org/Uploads/Benchmark/5577/img/Capture4.PNG, y = http://www.cpalms.org/Uploads/Benchmark/5577/img/Capture3.PNG, and classify them as representing exponential growth or decay.* | | | | | | 2, 3 |
| [A-SSE.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5544) | Use the structure of an expression to identify ways to rewrite it. *For example, see x4- y4 as (x²)² – (y²)², thus recognizing it as a difference of squares that can be factored as (x² – y²)(x² + y²).* | | | | | | 7,8 |
| **Learning Goal and Scale** | | | | **Instructional Strategies & Misconceptions** | | | |
| [**A202:** Create equations that represent real-world mathematical relationships, including constraints and literal equations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_02.docx)  [**A212:** Derive complex solutions from quadratic functions, and perform operations on complex numbers.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_12.docx) | | | | **Common Errors with Transformations pg. 63B**  **Common Errors when Describing and Graphing Quadratic Functions pg. 203A Students often rely on graphing calculators and do not use information from the equation to visualize the graph.**  **Common Errors when Finding Zeros of Quadratic Functions pg. 203B Mistakes may occur when students use graphing calculators to solve the quadratic formula because they fail to use parentheses correctly.** | | | |
| **Math Practices for Unit** | | | **Unit Connections** | | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Solving linear equations * Solving absolute value inequalities * Writing and graphing equations in slope-intercept form * Identify translations * Solving systems of equations | |  |  | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **FIRST QUARTER** | | | | | | |
| **Unit 2: Quadratic Functions and Equations** | | | | | | |
| **Learning Goal** | [**A202:** Create equations that represent real-world mathematical relationships, including constraints and literal equations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_02.docx)  [**A212:** Derive complex solutions from quadratic functions, and perform operations on complex numbers.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_12.docx) | | | | **Suggested # of Days** | **12** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| 2 | [A-REI.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5561)  [A-SSE.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5545)  [F-IF.3.8](http://www.cpalms.org/Public/PreviewStandard/Preview/5577) | 4.5: Quadratic Equations | Pg. 248 - #11, 22, 29 |  | | |
| 3 | 4.6: Completing the Square (At this stage, use this as a solution method as well as rewriting a parabola to identify transformations). | Pg. 258 - #26-28, 43 |  | | |
| 2 | [A-REI.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5561) | 4.7: Quadratic Formula | Pg. 266 - #30, 49, 51 |  | | |
| 3 | [A-REI.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5561)  [N-CN.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5522)  [N-CN.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5523)  [N-CN.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5528) | 4.8: Complex Numbers (Do not need to divide, or graph them on the Complex plane – Skip examples 2 and 5). | Pg. 276 - #29, 32, 34 |  | | |
| 2 |  | Review and Assessment |  |  | | |

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| **Unit 3: Polynomial Functions and Equations** | | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | | **SMP** |
| [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578) | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)*. For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* | | | | | | 1, 2 |
| [A-APR.2.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5548) | 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). | | | | | | 1,3,6 |
| [A-APR.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5549) | 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. | | | | | | 1,3,7 |
| [A-APR.3.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5550) | Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity (x² + y²)² = (x² – y²)² + (2xy)² can be used to generate Pythagorean triples. | | | | | | 7,8 |
| [A-SSE.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5544) | Use the structure of an expression to identify ways to rewrite it. *For example, see x4- y4 as (x²)² – (y²)², thus recognizing it as a difference of squares that can be factored as (x² – y²)(x² + y²).* | | | | | | 7,8 |
| [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573) | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* | | | | | | 2, 5, 6 |
| [F-IF.2.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5575) | Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. | | | | | | 2, 6 |
| [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576) | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.   1. Graph linear and quadratic functions and show intercepts, maxima, and minima. 2. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. 3. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. 4. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. 5. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude, and using phaseshift. | | | | | | 3, 4, 5 |
| [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581) | Identify the effect on the graph of replacing f(x) by f(x)+k, kf(x), f(kx), and f(x+k) for specific values of k (both positive and negative); find the value of k given the graphs, Experiment with cases and illustrate and explanation of the effects on the graph using technology. | | | | | | 2, 3, 5 |
| [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574) | Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* | | | | | | 2, 4, 6 |
| [A-SSE.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5543) | Interpret expressions that represent a quantity in terms of its context.   1. Interpret parts of the expression, such as terms, factors, and coefficients. 2. Interpret complicated expressions by viewing one or more of their parts as a single entity. | | | | | | 4 |
| **Learning Goal and Scale** | | | | **Instructional Strategies & Misconceptions** | | | |
| [**A201:** Understand the relationship between zeros and factors of polynomials and use and prove polynomial identities to rewrite expressions.A205: Find patterns and structure in polynomial and rational expressions](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_01.docx)  [**A205:** Find patterns and structure in polynomial and rational expressions](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_05.docx)  [**A208:** Interpret functions that arise in real-world context, including restricting domain/range, and interpreting average rate of change.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_08.docx) | | | | **Common Errors with Transformations pg. 63B**  **Common Errors when Describing and Graphing Quadratic Functions pg. 203A Students often rely on graphing calculators and do not use information from the equation to visualize the graph.**  **Common Errors when Finding Zeros of Quadratic Functions pg. 203B Mistakes may occur when students use graphing calculators to solve the quadratic formula because they fail to use parentheses correctly.**  **Common Errors when Graphing and Describing Quadratic Function pg. 291A** | | | |
| **Math Practices for Unit** | | | **Unit Connections** | | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Graphing quadratic functions * Writing equations of parabolas * Solving quadratic equations by factoring and graphing * Finding the number and type of solutions | |  |  | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **FIRST QUARTER** | | | | | | |
| **Unit 3: Polynomial Functions and Equations** | | | | | | |
| **Learning Goal** | [**A201:** Understand the relationship between zeros and factors of polynomials and use and prove polynomial identities to rewrite expressions.A205: Find patterns and structure in polynomial and rational expressions](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_01.docx)  [**A205:** Find patterns and structure in polynomial and rational expressions](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_05.docx)  [**A208:** Interpret functions that arise in real-world context, including restricting domain/range, and interpreting average rate of change.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_08.docx) | | | | **Suggested # of Days** | **13**  **(3)** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| **For this unit on polynomials, in order to address standard F-IF.3.9, students should be exposed to polynomials in various forms and asked to discuss similarities and differences of the key features presented in this unit.** | | | | | | |
| 3 | [A-APR.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5549)  [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573)  [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574)  [F-IF.2.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5575)  [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578)  [A-SSE.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5543) | 5.2: Polynomial, Linear, Factors, and Zeros  (Include End Behavior from 5.1, increasing decreasing intervals (use interval notation) and average rate of change from precalculus 1.4.) | Pg. 303 - #4, 28, 29,  Pg. 307 - #15, 16, 19, 20 |  | | |
| 2 | [A-APR.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5549)  [A-SSE.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5544) | 5.3: Solving Polynomial Equations | Pg. 317 - #26, 28 |  | | |
| 2 | [A-APR.3.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5550) | Polynomial Identities | See ancillary materials. | [28-Polynomial Identities](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/28-polynomial_identities.docx) | | |
| 3 | [A-APR.4.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5552)  [A-APR.2.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5548) | 5.4: Dividing Polynomials (Using division (long and synthetic) and a suggested root, students should be able to divide the polynomial to find the other roots. Extend this into graphing polynomials of standard form when suitable factorizations exist). | Pg. 321 - #15, 18-22  Pg. 325 - #21-24, 29, 31 |  | | |
| 1 | [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581) | 5.9: Transforming Polynomial Functions | Pg. 365 - #6-10, 25-34 |  | | |
| 2 |  | Review and Assessment |  |  | | |
| **3** |  | District Assessment (1 day), 9 Weeks Exams (2 days) |  |  | | |

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| **Unit 4: Radical Expressions** | | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | | **SMP** |
| [N-RN.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5516) | 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. *For example, we define http://www.cpalms.org/Uploads/Benchmark/5516/img/Capture2.PNG to be the cube root of 5 because we want http://www.cpalms.org/Uploads/Benchmark/5516/img/Capture1.PNG = http://www.cpalms.org/Uploads/Benchmark/5516/img/Capture3.PNG to hold, so http://www.cpalms.org/Uploads/Benchmark/5516/img/Capture1.PNG must equal 5.* | | | | | | 1, 2 |
| [N-RN.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5517) | Rewrite expressions involving radicals and rational exponents using the properties of exponents. | | | | | | 2, 3 |
| [N-](http://www.cpalms.org/Public/PreviewStandard/Preview/5517)CP | Rewrite expressions involving radicals and rational exponents using the properties of exponents. | | | | | | 2, 3 |
| [A-REI.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5558) | Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. | | | | | | 1,2,6 |
| [A-REI.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5559) | Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. | | | | | | 1,6 |
| **Learning Goal and Scale** | | | | **Instructional Strategies & Misconceptions** | | | |
| [**A203:** Solve simple rational and radical equations including justifications and extraneous solutions.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_03.docx) | | | | **Common Errors when Using Radical Expressions pg. 379A Finding Roots, Simplifying Variables, and Finding Domain**  **Common Errors when Using Solving Radical Equations pg. 379B Squaring Both Sides and Extraneous Solutions**  **Common Errors when Graphing Radical Functions pg. 379B Finding the Inverse and Transformations** | | | |
| **Math Practices for Unit** | | | **Unit Connections** | | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Finding the domain and range of functions * Graphing quadratic functions * Multiplying binomials * Solving by factoring | |  |  | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **SECOND QUARTER** | | | | | | |
| **Unit 4: Radical Expressions** | | | | | | |
| **Learning Goal** | [**A203:** Solve simple rational and radical equations including justifications and extraneous solutions.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_03.docx) | | | | **Suggested # of Days** | **14** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| 1 | [N-RN.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5516) | Properties of Exponents - Concept Byte (Pg. 380) | ALL OF THEM!!!! |  | | |
| 2 | [N-RN.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5516)  [N-RN.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5517) | 6.1: Roots and Radical Expressions | Pg. 385 - #20, 22, 29, 30 |  | | |
| 2 | 6.2: Multiplying and Dividing Radical Expressions – (**Do NOT** assume the variables are nonnegative as stated in Example 3 on page 388. Students should be taught to use absolute values when simplifying even index radicals and the reduced variables have odd exponents.)  Example: | Pg. 389 - #16, 17, 20  Pg. 393 - #19, 25, 26, 28 |  | | |
| 2 | 6.3: Binomial Radical Expressions | Pg. 399 - #15, 34, 35, 42 |  | | |
| 2 | 6.4: Rational Exponents | Pg. 405 - #33  Pg. 410 - #37 |  | | |
| 3 | [A-REI.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5558)  [A-REI.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5559) | 6.5: Solving Square Root and Other Radical Expressions | Pg. 420 - #17, 19, 20  Pg. 424 - #25, 26 |  | | |
| 2 |  | Review and Assessment |  |  | | |

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| **Unit 5: Radical Functions and Equations** | | | | | | | | |
| **Code** | | **Mathematics Florida Standard** | | | | | | **SMP** |
| [F-BF.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5579) | Write a function that describes a relationship between two quantities.   1. Determine an explicit expression, a recursive process, or steps for calculation from a context. 2. Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.* 3. Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.* | | | | | | | 2,3,6,4 |
| [A-APR.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5547) | 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. | | | | | | | 3,5,6 |
| [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581) | Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.* | | | | | | | 2, 3, 5 |
| [F-BF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5582) | Find inverse functions.   1. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. *For example, f(x) =2 x³ or f(x) = (x+1)/(x–1) for x ≠ 1.* 2. Verify by composition that one function is the inverse of another. 3. Read values of an inverse function from a graph or a table, given that the function has an inverse. 4. Produce an invertible function from a non-invertible function by restricting the domain. | | | | | | | 1, 2, 6 |
| [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574) | Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* | | | | | | | 2, 4, 6 |
| [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576) | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.   1. Graph linear and quadratic functions and show intercepts, maxima, and minima. 2. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. 3. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. 4. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. 5. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude, and using phase shift. | | | | | | | 3, 4, 5 |
| [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578) | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)*. For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* | | | | | | | 1, 2 |
| **Learning Goal and Scale** | | | | | **Instructional Strategies & Misconceptions** | | | |
| [**A206:** Apply transformation rules to polynomial, exponential, logarithmic, trigonometric functions, as well as graphing basic inverse functions.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_06.docx)  [**A208:** Interpret functions that arise in real-world context, including restricting domain/range, and interpreting average rate of change](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_08.docx)**.**  [**A209:** Graph and write equivalent forms of functions by hand and using technology, and compare functions in different representations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_09.docx) | | | | | **Common Errors when Using Radical Expressions pg. 379A Finding Roots, Simplifying Variables, and Finding Domain**  **Common Errors when Using Solving Radical Equations pg. 379B Squaring Both Sides and Extraneous Solutions**  **Common Errors when Graphing Radical Functions pg. 379B Finding the Inverse and Transformations** | | | |
| **Math Practices for Unit** | | | | **Unit Connections** | | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | | 5. Use appropriate tools strategically. | * Finding the domain and range of functions * Graphing quadratic functions * Multiplying binomials * Solving by factoring | |  |  | |
| 2. Reason abstractly and quantitatively. | | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | | 8. Look for and express regularity in repeated reasoning. |

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| **SECOND QUARTER** | | | | | | |
| **Unit 5:** Radical Functions and Equations | | | | | | |
| **Learning Goal** | [**A206:** Apply transformation rules to polynomial, exponential, logarithmic, trigonometric functions, as well as graphing basic inverse functions.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_06.docx)  [**A208:** Interpret functions that arise in real-world context, including restricting domain/range, and interpreting average rate of change](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_08.docx)**.**  [**A209:** Graph and write equivalent forms of functions by hand and using technology, and compare functions in different representations.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_09.docx) | | | | **Suggested # of Days** | **8** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| **For this unit on radicals, in order to address standard F-IF.3.9, students should be exposed to radicals in various forms and asked to discuss similarities and differences of the key features presented in this unit.** | | | | | | |
| 2 | [F-BF.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5579)  [A-APR.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5547) | 6.6: Function Operations (Discuss the closure of polynomials under the operations of addition, subtraction, and multiplication). | Pg. 431 - #28, 29, 40, 41, |  | | |
| 2 | [F-BF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5582) | 6.7: Inverse Relations and Functions | Pg. 436 - #30  Pg. 440 - #10, 18 |  | | |
| 2 | [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573)  [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574)  [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578)  [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581) | 6.8: Graphing Radical Functions (For this lesson, in order to address the standard, please make sure to discuss the restricted domain) | Pg. 448 - #18, 34, 35 |  | | |
| 2 |  | Review and Assessment |  |  | | |

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| **Unit 6: Sequence and Series** | | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | | **SMP** |
| [F-BF.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5579) | Write a function that describes a relationship between two quantities.   1. Determine an explicit expression, a recursive process, or steps for calculation from a context. 2. Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.* 3. Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.* | | | | | | 2,3,6,4 |
| [F-BF.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5580) | Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. | | | | | | 2,3,4 |
| [A-SSE.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5543) | Interpret expressions that represent a quantity in terms of its context.   1. Interpret parts of an expression, such as terms, factors, and coefficients. 2. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret http://www.cpalms.org/Uploads/Benchmark/5543/img/Capture1.PNG as the product of P and a factor not depending on P.* | | | | | | 1,2,4 |
| [A-SSE.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5545) | Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.   1. Factor a quadratic expression to reveal the zeros of the function it defines. 2. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. 3. Use the properties of exponents to transform expressions for exponential functions. *For example the expression http://www.cpalms.org/Uploads/Benchmark/5545/img/Capture1.PNG can be rewritten as http://www.cpalms.org/Uploads/Benchmark/5545/img/Capture2.PNG ≈ http://www.cpalms.org/Uploads/Benchmark/5545/img/Capture3.PNG to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.* | | | | | | 1,3 |
| [A-SSE.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5546) | Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments.* | | | | | | 1,3 |
| **Learning Goal and Scale** | | | | **Instructional Strategies & Misconceptions** | | | |
| [**A207:** Construct, compare, and interpret exponential and logarithmic models, including building functions that model a relationship from an arithmetic, geometric or recursive sequence or series.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_07.docx) | | | | **Common Errors with Arithmetic Sequences and Series pg. 583A When using summation notation, students should count the actual number of terms rather than looking at the upper limit.**  **Common Errors with Geometric Sequences and Series pg. 583B**  **Common Errors when Using Recursive Definitions pg. 583B** | | | |
| **Math Practices for Unit** | | | **Unit Connections** | | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Evaluating functions * Identify mathematical patterns * Simplifying complex fractions | |  |  | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **SECOND QUARTER** | | | | | | |
| **Unit 6: Sequence and Series** | | | | | | |
| **Learning Goal** | [**A207:** Construct, compare, and interpret exponential and logarithmic models, including building functions that model a relationship from an arithmetic, geometric or recursive sequence or series.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_07.docx) | | | | **Suggested # of Days** | **8** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| 2 | [F-BF.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5579)  [F-BF.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5580) | 9.2: Arithmetic Sequences | Pg. 596 - #27, 34, 41 |  | | |
| 2 | [F-BF.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5579)  [F-BF.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5580)  [A-SSE.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5543)  [A-SSE.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5545) | 9.3: Geometric Sequences | Pg. 604 - #17, 38 |  | | |
| 2 | [A-SSE.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5546)  [A-SSE.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5543) | 9.5: Geometric Series (To address the standard, ensure that students are also able to derive the formula for a finite geometric series).  **OMIT infinite series** | Pg. 619 - #13, 35 | To derive the formula for a finite geometric series.  <http://www.mathalino.com/reviewer/derivation-of-formulas/sum-of-finite-and-infinite-geometric-progression> | | |
| 2 |  | Review and Assessment |  |  | | |

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| **Unit 7: Exponential Functions and Equations** | | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | | **SMP** |
| [A-SSE.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5543) | Interpret expressions that represent a quantity in terms of its context.  a. Interpret parts of an expression, such as terms, factors, and coefficients.  b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret as the product of and a factor not depending on P. | | | | | | 1,2 |
| [A-SSE.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5545) | Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.  a. Factor a quadratic expression to reveal the zeros of the function it defines.  b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.  c. Use the properties of exponents to transform expressions for exponential functions. For example the expression can be rewritten as to reveal the approximate equivalent monthly interest rate if the annual rate is 15%. | | | | | | 1,3 |
| [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573) | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. | | | | | | 2,5,6 |
| [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574) | Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function. | | | | | | 2,6 |
| [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576) | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.  a. Graph linear and quadratic functions and show intercepts, maxima, and minima.  b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.  c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.  d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.  e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude, and using phase shift. | | | | | | 3,5 |
| [F-IF.3.8](http://www.cpalms.org/Public/PreviewStandard/Preview/5577) | Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.  a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.  b. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as , and classify them as representing exponential growth or decay. | | | | | | 2,3 |
| [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578) | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum. | | | | | | 1,2 |
| [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581) | Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. | | | | | | 2,3,5 |
| [F-BF.2.a](http://www.cpalms.org/Public/PreviewStandard/Preview/8471) | Use the change of base formula. | | | | | | 5, 7 |
| [F-LE.1.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5587) | For exponential models, express as a logarithm the solution to where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology. | | | | | | 3, 6 |
| [F-LE.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5588) | Interpret the parameters in a linear or exponential function in terms of a context. | | | | | | 1, 2 |
| **Learning Goal and Scale** | | | | **Instructional Strategies & Misconceptions** | | | |
| [**A207:** Construct, compare, and interpret exponential and logarithmic models, including building functions that model a relationship from an arithmetic, geometric or recursive sequence or series.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_07.docx)  [**A209:** Graph and write equivalent forms of functions by hand and using technology, and compare functions in different representations**.**](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_09.docx) | | | | **Common Errors when Using Exponential Models pg. 461A**  **Common Errors when Solving Exponential Equations pg. 461B** | | | |
| **Math Practices for Unit** | | | **Unit Connections** | | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Evaluating expressions * Using linear models * Graphing transformations * Simplifying radicals   Finding inverses | |  |  | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **SECOND QUARTER** | | | | | | |
| **Unit 7: Exponential Functions and Equations** | | | | | | |
| **Learning Goal** | [**A207:** Construct, compare, and interpret exponential and logarithmic models, including building functions that model a relationship from an arithmetic, geometric or recursive sequence or series.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_07.docx)  [**A209:** Graph and write equivalent forms of functions by hand and using technology, and compare functions in different representations**.**](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_09.docx) | | | | **Suggested # of Days** | **11**  **(5)** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| **For this unit on exponentials, in order to address standard F-IF.3.9, students should be exposed to exponentials in various forms and asked to discuss similarities and differences of the key features presented in this unit.** | | | | | | |
| 1 | [A-SSE.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5543)  [A-SSE.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5545)  [F-IF.3.8](http://www.cpalms.org/Public/PreviewStandard/Preview/5577)  [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578)  [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-LE.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5588) | 7.1: Exploring Exponential Models | Pg. 467 - #22, 23, 25, 27, 35 |  | | |
| 2 | [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578)  [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574)  [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573)  [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581) | 7.2: Properties of Exponential Functions | Pg. 475 - #19  Pg. 478 - #5-7, 11, 12 |  | | |
| 2 | [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574)  [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573) | 7.3: Logarithmic Functions as Inverses | Pg. 486 - #29-31, 36-39, 59-64 |  | | |
| 1 | [F-BF.2.a](http://www.cpalms.org/Public/PreviewStandard/Preview/8471) | 7.4: Properties of Logarithms (Change of Base Only) | Pg. 495 - #17-22, 45-47 |  | | |
| 3 | [F-LE.1.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5587) | 7.5: Exponential and Logarithmic Equations (Solving Exponential Equations Only).  ADD Natural Logarithms: (Solving Exponential Equations Only using change of base formula) Using technology | Pg. 505 - #5-11  Pg. 506 - #36-37 | [16-notes.natural.log.equations and HW](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/16-notes.natural.log.equations_and_hw.pdf) | | |
| 2 |  | Review and Assessment |  |  | | |
| **5** |  | District Assessment (1 day); PSAT (1); 9 Weeks Exams (3 days) |  |  | | |

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| **Unit 8: Rational Functions and Equations** | | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | | **SMP** |
| [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573) | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* | | | | | | 2,4,5,6 |
| [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574) | Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* | | | | | | 2, 4, 6 |
| [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576) | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.   1. Graph linear and quadratic functions and show intercepts, maxima, and minima. 2. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. 3. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. 4. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. 5. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude, and using phase shift. | | | | | | 3, 4, 5 |
| [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578) | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)*. For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* | | | | | | 1, 2 |
| [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581) | Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.* | | | | | | 2, 3, 5 |
| [A-APR.4.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5552) | Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system. | | | | | | 2,3,8 |
| [A-CED.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5554) | Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions. | | | | | | 3,4,5 |
| [A-REI.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5559) | Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. | | | | | | 3,4,5 |
| **Learning Goal and Scale** | | | | **Instructional Strategies & Misconceptions** | | | |
| [**A203:** Solve simple rational and radical equations including justifications and extraneous solutions.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_03.docx) | | | | **Common Errors with Inverse Variation and Graphing pg. 519A**  **Common Errors when Graphing Rational Functions pg. 519B**  **Common Errors when Solving Rational Expressions and Equations pg. 519B** | | | |
| **Math Practices for Unit** | | | **Unit Connections** | | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Factoring quadratic expressions * Solving quadratic equations | |  |  | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **THIRD QUARTER** | | | | | | |
| **Unit 8: Rational Functions and Equations** | | | | | | |
| **Learning Goal** | [**A203:** Solve simple rational and radical equations including justifications and extraneous solutions.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_03.docx) | | | | **Suggested # of Days** | **17** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| **For this unit on rationals, in order to address standard F-IF.3.9, students should be exposed to rationals in various forms and asked to discuss similarities and differences with the key features presented in this unit.** | | | | | | |
| 2 | [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573)  [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574)  [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578)  [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581)  [A-APR.4.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5552) | 8.2: The Reciprocal Function Family (For example, show that is equivalent to  .) This is needed for A-APR.4.6 | Pg. 535 - #16-22: Modify textbook instructions to include rewriting reciprocal family functions as a rational function. (see left) |  | | |
| 5 | 8.3: Rational Functions (For example, show that is equivalent to using long division when possible) | Pg. 544 - #9, 15, 19, 26, and 39 can be rewritten as reciprocal functions using long division. |  | | |
| 2 | [A-APR.4.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5553) | 8.4: Rational Expressions | Pg. 551 - #6, 22, 37 |  | | |
| 3 | [A-APR.4.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5553) | 8.5: Adding and Subtracting Rational Expressions  **OMIT** Pg. 555-Problem 1 on Least Common Multiple | Pg. 563 - #15, 24, 25, 29 |  | | |
| 3 | [A-CED.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5554)  [A-REI.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5559) | 8.6: Solving Rational Equations | Pg. 569 - #5, 15, 18, 22-24 |  | | |
| 2 |  | Review and Assessment |  |  | | |

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| **Unit 9: Probability** | | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | | **SMP** |
| [S-CP.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5656) | Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”). | | | | | | 1, 3, 4 |
| [S-CP.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5657) | Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. | | | | | | 1, 2, 4 |
| [S-CP.1.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5658) | Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B. | | | | | | 1, 2, 4 |
| [S-CP.1.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5659) | Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. *For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.* | | | | | | 1, 2, 3, 4 |
| [S-CP.1.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5660) | Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. *For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.* | | | | | | 3, 4, 8 |
| [S-CP.2.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5661) | Find the conditional probability of A given B as the fraction of B’s outcomes that also belong to A, and interpret the answer in terms of the model. | | | | | | 3, 4 |
| [S-CP.2.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5662) | Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model. | | | | | | 2, 3, 4 |
| **Learning Goal and Scale** | | | | **Instructional Strategies & Misconceptions** | | | |
| [**A210:** Understand independence and conditional probability and use the rules of probability to compute and interpret data in a probability model.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_10.docx) | | | |  | | | |
| **Math Practices for Unit** | | | **Unit Connections** | | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Evaluating expressions containing fractions and percentages * Simplify polynomial expressions | |  |  | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **THIRD QUARTER** | | | | | | |
| **Unit 9: Probability** | | | | | | |
| **Learning Goal** | [**A210:** Understand independence and conditional probability and use the rules of probability to compute and interpret data in a probability model.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_10.docx) | | | | **Suggested # of Days** | **9** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| 2 | [S-CP.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5656)  [S-CP.2.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5662) | 4.2.1, 4.2.2, 4.2.3: Probability Models |  | 4.2.1 Using an Area Model [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/4.2.1_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/4.2.1_se.pdf)  4.2.2 Using a Tree Diagram [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/4.2.2_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/4.2.2_se.pdf)  4.2.3 Probability Models [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/4.2.3_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/4.2.3_se.pdf)  [26-Basic Statistics Powerpoint](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/26-basic_statistics_powerpoint.pptx)  [27-4.2.1-4.2.3 Probability Models](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/27-4.2.1-4.2.3_probability_models__4.2.4_unions_intersections_and_complements.docx)  4.2.4 Unions, Intersections, and Complements [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/4.2.4_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/4.2.4_se.pdf) | | |
| 1 | [S-CP.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5656) | 4.2.4: Unions, Intersections, and Complements |  | 4.2.4 Unions, Intersections, and Complements | | |
| 1 | [S-CP.1.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5658)  [S-CP.1.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5660)  [S-CP.2.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5661) | 10.2.1: Conditional Probability and Independence |  | 10.2.1 Conditional Probability and Independence [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/10.2.1_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/10.2.1_se.pdf) | | |
| 1 | [S-CP.1.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5658)  [S-CP.1.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5659)  [S-CP.1.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5660)  [S-CP.2.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5661) | 10.2.2: Two-Way Tables |  | 10.2.2 Two-Way Tables [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/10.2.2_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/10.2.2_se.pdf) | | |
| 2 | [S-CP.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5657)  [S-CP.1.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5658)  [S-CP.1.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5659)  [S-CP.1.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5660)  [S-CP.2.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5661)  [S-CP.2.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5662) | 10.2.3: Applications of Probability |  | 10.2.3 Applications of Probability [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/10.2.3_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/10.2.3_se.pdf) | | |
| 2 |  | Review and Assessment |  |  | | |

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| **Unit 10: Statistics** | | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | | **SMP** |
| [S-ID.1.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5644) | Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. | | | | | | 1, 3, 4, 5 |
| [S-IC.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5650) | Understand statistics as a process for making inferences about population parameters based on a random sample from that population. | | | | | | 1, 2, 4 |
| [S-IC.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5651) | Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?* | | | | | | 1, 2, 4 |
| [S-IC.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5652) | Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. | | | | | | 1, 3, 4, 8 |
| [S-IC.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5653) | Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling. | | | | | | 1, 2, |
| [S-IC.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5654) | Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. | | | | | | 1, 2, 4 |
| [S-IC.2.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5655) | Evaluate reports based on data. | | | | | | 1, 4, 6 |
| **Learning Goal and Scale** | | | | **Instructional Strategies & Misconceptions** | | | |
| [**A213:** Use surveys, experiments and observational studies to collect data.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_13.docx)  [**A214:** Make inferences and justify statistical conclusions about data.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_14.docx) | | | |  | | | |
| **Math Practices for Unit** | | | **Unit Connections** | | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Evaluating expressions containing fractions and percentages * Simplify polynomial expressions | |  |  | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **THIRD QUARTER** | | | | | | |
| **Unit 10: Statistics** | | | | | | |
| **Learning Goal** | [**A213:** Use surveys, experiments and observational studies to collect data.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_13.docx)  [**A214:** Make inferences and justify statistical conclusions about data.](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_14.docx) | | | | **Suggested # of Days** | **16**  **(4)** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| 3 | [S-IC.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5650)  [S-IC.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5652)  [S-IC.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5653)  [S-IC.2.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5655) | 9.1.1, 9.1.2, 9.1.3: Surveys and Bias |  | [9 Resource Pages](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9_resource_pages.pdf)  9.1.1 Survey Design [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.1.1_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.1.1_se.pdf)  9.1.2 Samples and the Role of Randomness [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.1.2_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.1.2_se.pdf)  9.1.3 Bias in Convenience Samples [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.1.3_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.1.3_se.pdf)  [21-9.1.1-9.1.3 Surveys and Bias Support Word Doc](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/21_-_9.1.1-9.1.3_surveys_and_bias_support.docx) | | |
| 2 | [S-IC.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5652)  [S-IC.2.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5655) | 9.2.1, 9.2.2: Experiments Versus Observational Studies |  | 9.2.1 Testing Cause and Effect with Experiments [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.2.1_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.2.1_se.pdf)  9.2.2 Conclusions from Studies [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.2.2_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.2.2_se.pdf)  [22-9.2.2 Experiments Versus Observational Studies Support Word Doc](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/22-9.2.1-9.2.2_experiments_versus_observational__studies_support.docx) | | |
| 3 | [S-ID.1.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5644)  [S-IC.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5651)  [S-IC.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5653) | 9.3.1, 9.3.2, 9.3.3: Normal Probability Distributions |  | 9.3.1 Relative Frequency Histograms [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.3.1_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.3.1_se.pdf)  9.3.2 The Normal Probability Density Function [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.3.2_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.3.2_se.pdf)  9.3.3 Percentiles [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.3.3_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9.3.3_se.pdf)  Chapter 9 Closure [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9_closer_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9_closer_se.pdf)  Chapter 9 Additional Review Problems [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9_additional_review_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9_additional_review.pdf)  [23-9.3.1- 9.3.3 Normal Probability Distributions Support Word Doc](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/23-9.3.1-_9.3.3_normal_probability_distributions_support.docx) | | |
| 3 | [S-IC.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5651)  [S-IC.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5653) | 11.1.1, 11.1.2, 11.1.3: Simulations and Variability |  | [11 Resource Pages](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11_resource_pages.pdf)  11.1.1 Simulations of Probability [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.1.1_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.1.1_se.pdf)  11.1.2 More Simulations of Probability [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.1.2_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.1.2_se.pdf)  11.1.3 Simulating Sampling Variability [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.1.3_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.1.3_se.pdf)  [24-11.1.1-11.1.2 Simulations Support Word Doc](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/24-11.1.1-11.1.2__simulations_support.docx) | | |
| 3 | [S-IC.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5650)  [S-IC.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5653)  [S-IC.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5654) | 11.2.1, 11.2.2, 11.2.3, 11.2.4: Variability and Control |  | 11.2.1 Statistical Test Using Sampling Variability [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.2.1_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.2.1_se.pdf)  11.2.2 Variability in Experimental Results [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.2.2_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.2.2_se.pdf)  11.2.3 Quality Control [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.2.3_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.2.3_se.pdf)  11.2.4 Statistical Process Control [TE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.2.4_te.pdf) and [SE](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11.2.4_se.pdf)  [25-11.2.2 Variability and Control Support Word Doc](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/25-11.2.1-11.2.2_variability_and_control_support.docx) | | |
| 2 |  | Review and Assessment |  |  | | |
| **4** |  | District Assessment (1 day); FSA/PLA Writing (1 day); 9 Weeks Exams (2 days) |  |  | | |

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| **Unit 11: Trigonometric Functions** | | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | | **SMP** |
| [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581) | Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.* | | | | | | 2, 3, 5 |
| [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573) | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* | | | | | | 2,4,5,6 |
| [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574) | Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* | | | | | | 2, 4, 6 |
| [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576) | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.   1. Graph linear and quadratic functions and show intercepts, maxima, and minima. 2. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. 3. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. 4. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. 5. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude, and using phase shift. | | | | | | 3, 4, 5 |
| [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578) | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)*. For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* | | | | | | 1, 2 |
| [F-TF.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5589) | Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle; Convert between degrees and radians. | | | | | | 1, 2, 6 |
| [F-TF.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5590) | 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. | | | | | | 1, 2, 6 |
| [F-TF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5593) | Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. | | | | | | 2, 4 |
| [F-TF.3.8](http://www.cpalms.org/Public/PreviewStandard/Preview/5596) | Prove the Pythagorean identity sin²(θ) + cos²(θ) = 1 and use it to calculate trigonometric ratios. | | | | | | 1, 3 |
| **Learning Goal and Scale** | | | | **Instructional Strategies & Misconceptions** | | | |
| [**A211:** Model periodic phenomena using the unit circle and trigonometric functions. Prove and apply trigonometric identities**.**](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_11.docx) | | | |  | | | |
| **Math Practices for Unit** | | | **Unit Connections** | | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Express angle measures in degrees * Write trigonometric ratios for angle Ɵ in a given right triangle * Graphing transformations | | Glencoe Precalculus  <http://teachers.henrico.k12.va.us/math/ito_08/>  <http://regentsprep.org/Regents/math/algtrig/math-algtrig.htm> |  | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **FOURTH QUARTER** | | | | | | |
| **Unit 11: Trigonometric Functions** | | | | | | |
| **Learning Goal** | [**A211:** Model periodic phenomena using the unit circle and trigonometric functions. Prove and apply trigonometric identities**.**](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_11.docx) | | | | **Suggested # of Days** | **12** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| **For this unit on trigonometric functions, in order to address standard F-IF.3.9, students should be exposed to on trigonometric functions in various forms and asked to discuss similarities and differences of the key features presented in this unit.** | | | | | | |
| 2 | [F-TF.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5589) | Precalculus: Chapter 4.2: Degrees and Radians  (Examples 1-4) |  | [1-NOTES: Angle Measures](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/1-notes-_angle_measures.pdf)  [5-Activity- Angles in Degrees & Radians](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/5-activity-_angles_in_degrees__radians.pdf)  [6-Paper Plate Radians Activity](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/6-paper_plate_radians_activity.pdf)  [7-Homework: Angles in Degrees & Radians](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/7-angles_in_degrees__radians__homework.pdf) | | |
| 4 | [F-TF.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5590)  [F-TF.3.8](http://www.cpalms.org/Public/PreviewStandard/Preview/5596) | Precalculus: Chapter 4.3: Trigonometric Functions on the Unit Circle |  | [2-Notes: Angles & Circular Functions](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/2-notes_angular__circular_functions.pdf)  [3-Notes: Trig Functions of Special Angles](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/3-notes-_trig_functions_of_special_angles.pdf)  [4-NOTES: Solving Right Triangles](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/4-notes-_solving_right_triangles.pdf)  Proof of Pythagorean Identities: <http://regentsprep.org/Regents/math/algtrig/ATT9/pythagoreanid.htm>  [8-Homework: Trig Functions of Special Angles](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/8-trig_functions_of_special_angles__homework.pdf)  [9-Homework 2- Trig Functions of Special Angles](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/9-trig_functions_of_special_angles__homework_2.pdf)  [10-Homework 3- Solving Right Triangles](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/10-solving_right_triangles_-_homework3.pdf)  [11-Right Triangle Problems – Homework](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/11-right_triangle_problems__homework.pdf)  [12-Worksheet: Circular Functions](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/12-worksheet-circular_functions.pdf) | | |
| 3 | [F-TF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5593)  [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581)  [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574)  [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573)  [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578) | Precalculus: Chapter 4.4: Graphing Sine and Cosine Functions |  | [13- Notes- GRAPHS OF SINE AND COSINE **(**Slides 1-21 only)](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/13-notes-graphs_of_sines_and_cosines.pdf)  [14-WS-graphing\_sine\_and\_cosine](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/14-ws-graphing_sine_and_cosine.doc) | | |
| 3 |  | Review and Assessment |  |  | | |

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| **Unit 12: Linear and Nonlinear System** | | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | | **SMP** |
| [A-REI.3.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5563) | Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. | | | | | | 2,5,6 |
| [A-REI.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5564) | 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 x² + y² = 3.* | | | | | | 2,5,6 |
| [A-REI.4.11](http://www.cpalms.org/Public/PreviewStandard/Preview/5568) | Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. | | | | | | 2,4,5 |
| **Learning Goal and Scale** | | | | **Instructional Strategies & Misconceptions** | | | |
| [**A204:** Solve systems of linear and quadratic equations (including 3x3 systems)](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_04.docx)**.** | | | | **Common Errors with Solving Equations pg. 3B**  **Common Errors with Graphing Calculators pg. 63B Graphing calculator errors can happen when students do not remember the steps involved. Make a sheet of instructions available until students are comfortable with steps.**  **Common Errors when Describing and Graphing Quadratic Functions pg. 203A Students often rely on graphing calculators and do not use information from the equation to visualize the graph.** | | | |
| **Math Practices for Unit** | | | **Unit Connections** | | **Instructional Resources** | | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Evaluating algebraic expressions * Writing linear equations in slope-intercept form * Graphing linear equations | |  |  | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **FOURTH QUARTER** | | | | | | |
| **Unit 12: Linear and Nonlinear Systems** | | | | | | |
| **Learning Goal** | [**A204:** Solve systems of linear and quadratic equations (including 3x3 systems)](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_04.docx)**.** | | | | **Suggested # of Days** | **8** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| 2 | [A-REI.3.6](http://www.cpalms.org/Public/PreviewStandard/Preview/5563) | 3.5: Systems with Three Variables | Pg. 182 - #21, 22, 23 |  | | |
| 2 | [A-REI.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5564) | 4.9 (HONORS BOOK): Solving Linear and Quadratic Systems | See ancillary materials. | [15-Notes-HW-Systems-linear& quadratic](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/15-notes-hw-_systems-linear__quadratic.pdf) | | |
| 2 | [A-REI.4.11](http://www.cpalms.org/Public/PreviewStandard/Preview/5568) | Using technology solve system of equations of rational and radical equations | See ancillary materials. | [17- Powerpoint Solve system of equations of radical and rational equations using technology](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/17-powerpoint_solve_system_of_equations_of_radical_and_rational.pptx)  [18-worksheetSolve system of equations of radical and rational equations using technology](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/18-worksheet_solve_system_of_equations_of_radical_and_rational_equations_using_technology.docx) | | |
| 2 |  | Review and Assessment |  |  | | |

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| **Unit 13: Trigonometric Functions (Part 2)** | | | | | | |
| **Code** | **Mathematics Florida Standard** | | | | | **SMP** |
| [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581) | Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.* | | | | | 2, 3, 5 |
| [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573) | For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* | | | | | 2,4,5,6 |
| [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574) | Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* | | | | | 2, 4, 6 |
| [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576) | Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.   1. Graph linear and quadratic functions and show intercepts, maxima, and minima. 2. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. 3. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. 4. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. 5. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude, and using phase shift. | | | | | 3, 4, 5 |
| [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578) | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)*. For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.* | | | | | 1, 2 |
| [F-TF.1.1](http://www.cpalms.org/Public/PreviewStandard/Preview/5589) | Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle; Convert between degrees and radians. | | | | | 1, 2, 6 |
| [F-TF.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5590) | 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. | | | | | 1, 2, 6 |
| [F-TF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5593) | Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. | | | | | 2, 4 |
| [F-TF.3.8](http://www.cpalms.org/Public/PreviewStandard/Preview/5596) | Prove the Pythagorean identity sin²(θ) + cos²(θ) = 1 and use it to calculate trigonometric ratios. | | | | | 1, 3 |
| **Learning Goal and Scale** | | | | **Instructional Strategies & Misconceptions** | | |
| [**A211:** Model periodic phenomena using the unit circle and trigonometric functions. Prove and apply trigonometric identities**.**](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_11.docx) | | | | This is to be taught after the EOC | | |
| **Math Practices for Unit** | | | **Unit Connections** | | **Instructional Resources** | |
| 1. Make sense of problems and persevere in solving them. | | 5. Use appropriate tools strategically. | * Express angle measures in degrees * Write trigonometric ratios for angle Ɵ in a given right triangle * Graphing transformations | | Glencoe Precalculus  <http://teachers.henrico.k12.va.us/math/ito_08/>  <http://regentsprep.org/Regents/math/algtrig/math-algtrig.htm> | |
| 2. Reason abstractly and quantitatively. | | 6. Attend to precision. |
| 3. Construct viable arguments & critique reasoning of others. | | 7. Look for and make use of structure. |
| 4. Model with mathematics. | | 8. Look for and express regularity in repeated reasoning. |

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| **FOURTH QUARTER** | | | | | | |
| **Unit 13: Trigonometric Functions (Part 2)** | | | | | | |
| **Learning Goal** | [**A211:** Model periodic phenomena using the unit circle and trigonometric functions. Prove and apply trigonometric identities**.**](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/scale_a2_11.docx) | | | | **Suggested # of Days** | **16**  **(10)** |
| **Approx. # of Day(s)** | **MAFS** | **Lesson Objective (Instructional Resources)** | **Suggested Assignments/Assessments** | **Ancillary Materials** | | |
| **For this unit on trigonometric functions, in order to address standard F-IF.3.9, students should be exposed to on trigonometric functions in various forms and asked to discuss similarities and differences of the key features presented in this unit.** | | | | | | |
| 5 | [F-TF.1.2](http://www.cpalms.org/Public/PreviewStandard/Preview/5590)  [F-TF.3.8](http://www.cpalms.org/Public/PreviewStandard/Preview/5596) | Precalculus: Chapter 4.1: Right Triangle Trigonometry – Focus on finding the six trigonometric ratios – Sine, Cosine, Tangent, Cosecant, Secant, and Cotangent – as well as the inverse of the ratios to find the angles in a right triangle. | From Glencoe –  **Precalculus Book**  Pg. 227 - #1-18  Pg. 227 - #31-38 | Precalculus – Glencoe  4.1 – Right Triangle Trigonometry | | |
| 5 | [F-TF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5593)  [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581)  [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574)  [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573)  [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578) | Precalculus: Graphing Sine and Cosine Functions - Modeling Sine and Cosine waves | See Ancillary Worksheets | [29 -Sinusoidal Word Problems Worksheet 1](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/29_-sinusoidal_word_problems_worksheet_1.pdf)  [30 -Sinusoidal Word Problems Worksheet 2](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/30-_sinusoidal_word_problems_worksheet_2_.png)  [31 -Sinusoidal Word Problems Worksheet 3](http://scpsmath.weebly.com/uploads/2/9/1/7/29174797/31_-_sinusoidal_word_problems_worksheet_3_.png) | | |
| 3 | [F-TF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5593)  [F-BF.2.3](http://www.cpalms.org/Public/PreviewStandard/Preview/5581)  [F-IF.3.7](http://www.cpalms.org/Public/PreviewStandard/Preview/5576)  [F-IF.2.5](http://www.cpalms.org/Public/PreviewStandard/Preview/5574)  [F-IF.2.4](http://www.cpalms.org/Public/PreviewStandard/Preview/5573)  [F-IF.3.9](http://www.cpalms.org/Public/PreviewStandard/Preview/5578) | Precalculus: Chapter 4.5: Graphing Other Trigonometric Functions – Practice graphing Tangent Functions and asymptotes. | From Glencoe –  **Precalculus Book**  Pg. 277 - #1, 2, 4, 6 | Precalculus – Glencoe  4.5 – Graphing Other Trigonometric Functions | | |
| 3 |  | Review and Assessment |  |  | | |
| 10 |  | FSA Review/Tests (7 days); 9 Weeks Exams (3 days) |  |  | | |