Moon Area School District Curriculum Map

Course: Algebra 2 Honors
Grade Level: 9-12
Content Area: Math
Frequency: Full-Year Course

Primary Resource(s) & Technology:
McDougal Littell Algebra 2, IXL online software,
Microsoft Teams, Promethean Boards, Student Laptops/iPads

Pennsylvania and/or focus standards referenced at:
www.pdesas.org
www.education.pa.gov

Big Ideas/EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
How does solving a linear equation differ from simplifying a linear expression? How can rewriting formulas help you? What is the relationship between a verbal model and an algebraic model? How does solving linear inequalities compare with solving linear equations? How are absolute value models used in manufacturing?	2.5.11.A (Introduced) 2.5.11.B (Introduced) 2.8.11.D (Introduced) 2.8.11.F (Introduced) 2.8.11.N (Introduced)	• Solving linear equations. Rewriting equations and formulas. Problem solving using algebraic models. Solving linear inequalities. Solving absolute value equations and inequalities.	August - September
When is a relation a function? How do the graphs of discrete and continuous functions differ?	2.1.11.A (Introduced) 2.4.11.E (Introduced)	• Functions and their graphs. Slope and rate of change. Quick graphs of linear equations. Writing equations of lines.	September

How can you tell from a line's graph if it has a positive, negative, or zero slope? What is an advantage of graphing a line using the slope-intercept form? How do you graph a linear equation? How do you write the equation of a line? How is direct variation used in real-life? What is a constant of variation and how is it related to slope?	2.5.11.B (Introduced) 2.5.11.C (Introduced) 2.8.11.J (Introduced) 2.8.11.L (Introduced) 2.8.11.Q (Introduced) 2.8.11.R (Introduced) 2.8.11.S (Introduced)	Use symbols, mathematical terminology, standard not and other types of mathematical representations to c concepts, procedures, generalizations, ideas and resu Present mathematical procedures and results clearly, correctly. Demonstrate the connection between algebraic equat geometry of relations in the coordinate plane. Write the equation of a line when given the graph of slope of the line and a point on the line. Represent functional relationships in tables, charts an Create and interpret functional models. Analyze properties and relationships of functions (e.g trigonometric, exponential, logarithmic).	
How do you use a graph to determine how many solutions there are for a system of linear equations? When using the linear combination method for solving a linear system, why would you want to have the coefficients of one of the variables be opposites? What is the procedure used to graph a system of linear inequalities? What is real-life situation that you can use functions of two variables to model? How do you solve a	2.5.11.C (Introduced) 2.8.11.D (Introduced) 2.8.11.F (Introduced) 2.8.11.G (Introduced) 2.8.11.J (Introduced) 2.8.11.Q (Introduced)	• Solving linear systems by graphing. Solving linear systems algebraically. Graphing and solving systems of linear inequalities. Solving systems of linear equations in three variables. Matrix addition, subtraction and scalar multiplication. Muiliplying matrices. Cramer's Rule Solve equations by using inverse matrices	October

system of linear equations in 3 variables? Explain how to add, subtract and use scalar multiplication for matrices. How do you find each element in the product of two matrices? How do you solve a system of equations using Cramer's Rule? Why would you want to find the inverse of a matrix?			
How are the values of a, b and c in a quadratic equation related to the graph of a quadratic function? How can you use a quadratic function in real life? What must be true about a quadratic function before you solve it? To graph a quadratic function, what are the advantages in having it written in vertex form or intercept form? How can factoring be used to solve quadratic equation when a=1 and a is not	2.1.11.A (Introduced) 2.5.11.A (Introduced) 2.5.11.C (Introduced) 2.5.11.D (Introduced) 2.8.11.G (Introduced) 2.8.11.J (Introduced) 2.8.11.N (Introduced) 2.8.11.Q (Introduced) 2.8.11.S (Introduced)	• Graphing quadratic functions (e.g., opposite, reciprocal, absolute va in standard form, logarithms). Select and use appropriate mathematical concepts an Graphing quadratic functions them to solving non-routine a in vertex or intercept form Present mathematical procedures and results clearly, Solving a quadratic equations by factoring Conclude a solution process with a summary of result Solving quadratic equation by present an acceptable response finding square roots valid. Operations with complex n systems of equations, systems of numbers Demonstrate the connection between algebraic equat geometry of relations in the coordinate plane. Completing the square Solve linear, quadratic and exponential equations both Quadratic formula and the discriminant ent functional relationships in tables, charts an Graphing and solving ies and relationships of functions (e.g quadratic inequalities xponential, logarithmic)	November

equal to 1? How can you use square roots to solve a quadratic equation? What is the procedure for each of the four basic operations on complex numbers? How can completing the square be used to find the maximum values of a function? How are the discriminant and the graph of a quadratic equation related? How do you solve quadratic inequalities in one variable? If you know 3 points on the graph of a quadratic function, how can you find an equation for the function?			Write quadratic functions and models	
How do you simplify algebraic expressions with exponents? Which occupations benefit from the ability to use scientific notation in computations? Which term in polynomial function is the most important in determining the end behavior of the function and why?	2.1.11.A (Introduced) 2.5.11.A (Introduced) 2.5.11.B (Introduced) 2.5.11.C (Introduced) 2.8.11.J (Introduced)	•	Using properties of ns (e.g., opposite, reciprocal, absolute va exponents. g logarithms). Evaluating and graphing ropriate mathematical concepts an polynomial functions. d apply them to solving non-routine a Adding, subtracting, and ematical terminology, standard not multiplying polynomials. mathematical representations to c concepts, procedures, generalizations, ideas and resu Factoring and solving polynomial equations. atical procedures and results clearly, correctly. The Remainder and Factor Theorems. onstrate the connection between algebraic equat geometry of relations in the coordinate plane. Finding rational zeros.	December/January

When would you factor a polynomial by grouping? How can you use the graph of a polynomial function to help determine its real roots? How might you use the fundamental theorem of algebra in real-life? How can you write a polynomila function that models a set of equally-spaced data?			Using the Fundamental Theorem of Algebra.	
What are some examples of how nth roots are used in real-life? How do you determine when to use an absolute value symbol when simplifying radicals? How do you describe the domain of the composition of two functions? How do you find the inverse of a relation? Why is it important to check for an extraneous solution?	2.1.11.A (Introduced) 2.5.11.A (Introduced) 2.5.11.C (Introduced) 2.8.11.J (Introduced) 2.8.11.N (Introduced) 2.8.11.Q (Introduced)	•	nth roots and rational exponents. Properties of rational exponents. Power functions and function operations. Inverse functions. Graphing square root and cube root functions. Solving radical equations.	February
How can you use exponential growth to determine the population of a city or town? What must you first know?	2.1.11.A (Introduced) 2.5.11.C (Introduced)	•	Exponential growth. Exponential decay. The number e.	March

What can you determine about a new car purchase using exponential decay? What is the significance of the number e when determining how your money grows in a bank? What does the change of base formula allow you to do?	2.8.11.J (Introduced) 2.8.11.N (Introduced) 2.8.11.Q (Introduced) 2.8.11.S (Introduced) 2.11.11.C (Introduced)	veterans day &"wiping of the tears" Solving exponential and logarithmic equations	ct on between algebraic equat geometry of relations in the coordinate plane. ratic and exponential equations both Represent functional relationships in tables, charts an Analyze properties and relationships of functions (e.g trigonometric, exponential, logarithmic). Graph and interpret rates of growth/decay
How can knowing what type of variation model you are working with help you determine the constant of variation? What is the significance of a horizontal and vertical asymptope? How do you determine an asymptope? What is the procedure for multiplying rational expressions involving polynomials? How is adding rational expressions like adding numerical fractions? How are rational equations used in real life?	2.5.11.A (Introduced) 2.5.11.C (Introduced) 2.6.11.D (Introduced) 2.8.11.D (Introduced) 2.8.11.J (Introduced) 2.8.11.Q (Introduced) 2.8.11.R (Introduced)	• Inverse and joint variation. Graphing simple rational functions. Graphing general rational functions. Multiplying and dividing rational expressions. Addition, subtraction, and complex fractions. Solving rational equations.	April/May priate mathematical concepts an mathematics and apply them to solving non-routine a ent mathematical procedures and results clearly, correctly. e predictions using interpolation, extrapolation, re technology to verify them. essions, equations, inequalities, systen inequalities and matrices to model routine and non-ro the connection between algebraic equat geometry of relations in the coordinate plane. Represent functional relationships in tables, charts an Create and interpret functional models.

How might you use summation notation? How might you use an arithmetic and a geometric sequence and series in a real-life situation? Give examples of each. How can you use an infinite geometric series to convert a repeating decimal to a fraction?	2.1.11.A (Introduced) 2.5.11.B (Introduced) 2.8.11.A (Introduced) 2.11.11.D (Introduced)	• An introduction to sequences (g[illegible]pposite, reciprocal, absolute va and series. ng logarithms). Arithmetic sequences and matical terminology, standard not series. nd other types of mathematical representations to c concepts, procedures, generalizations, ideas and resu Geometric sequences and series. nalyze a given set of data for the existence of a patt algebraically and graphically. Infinite geometric series. Determine sums of finite sequences of numbers and i Recursive rules for sequences.	May