Moon Area School District Curriculum Map

Course: Algebra 2
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

Essential Questions

1. How does solving a linear equation differ from simplifying a linear expression?
2. How can rewriting formulas help you?
3. What is the relationship between a verbal model and an algebraic model?
4. How do you graph a linear equation?
5. How do you write the equation of a line?
6. What is a constant of variation and how is it related to slope?
7. 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?
8. What is the procedure used to graph a system of linear inequalities?
9. What is real-life situation that you can use functions of two variables to model?
10. How can you use a quadratic function in real life?
11. What must be true about a quadratic function before you solve it?
12. To graph a quadratic function, what are the advantages in having it written in vertex form or intercept form?
13. How do you simplify algebraic expressions with exponents?
14. Which occupations benefit from the ability to use scientific notation in computations?
15. How can you use the graph of a polynomial function to help determine its real roots?
16. How do you describe the domain of the composition of two functions?
17. How do you find the inverse of a relation?
18. Why is it important to check for an extraneous solution?
19. What does the change of base formula allow you to do?
20. How can you use exponential growth to determine the population of a city or town? What must you first know?
21. What can you determine about a new car purchase using exponential decay?
22. How can knowing what type of variation model you are working with help you determine the constant of variation?
23. What is the significance of a horizontal and vertical asymptote?

24. How do you determine an asymptote?
25. How might you use summation notation?
26. How might you use an arithmetic and a geometric sequence and series in a real-life situation? Give examples of each.
27. How can you use an infinite geometric series to convert a repeating decimal to a fraction?

Big Ideas/EQs	Focus Standard(s)	Assessed Competencies (Key content and skills)	Timeline
1, 2, and 3	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
4, 5, and 6	2.1.11.A (Introduced) 2.4.11.E (Introduced) 2.5.11.B (Introduced) 2.5.11.C (Introduced) 2.8.11.J (Introduced) 2.8.11.L (Introduced)	• Functions and their graphs. Slope and rate of change. Quick graphs of linear equations. Writing equations of lines.	September

	2.8.11.Q (Introduced)		Represent functional relationships in tables, charts an	
	2.8.11.R (Introduced)		Create and interpret functional models.	
	2.8.11.S (Introduced)		Analyze properties and relationships of functions (e.g trigonometric, exponential, logarithmic).	
7, 8, and 9	2.5.11.C (Introduced)	•	Solving linear systems by graphing.	al procedures and results clearly, ectly. October
	2.8.11.D (Introduced)		Solving linear systems algebraically.	sssions, equations, inequalities, systen ities and matrices to model routine and non-ro
	2.8.11.F (Introduced)		Graphing and solving systems of linear inequalities.	s of equations and inequalitie
	2.8.11.G (Introduced)		Solving systems of linear equations in three variables.	Analyze and explain systems of equations, systems of
	2.8.11.J (Introduced)		Matrix addition, subtraction and scalar multiplication. Multiplying matrices. Cramer's Rule Solve equations by using inverse matrices	ect on between algebraic equat geometry of relations in the coordinate plane.
	2.8.11.Q (Introduced)			al relationships in tables, charts an
10, 11, and 12	2.1.11.A (Introduced)	•	Graphing quadratic functions in standard form	pposite, reciprocal, absolute va arithms). November
	2.5.11.A (Introduced)		Graphing quadratic functions in vertex or intercept form	Select and use appropriate mathematical concepts an , them to solving non-routine a
	2.5.11.C (Introduced)		Solving a quadratic equations by factoring	Present mathematical procedures and results clearly,
	2.5.11.D (Introduced)		Solving quadratic equation by finding square roots.	Conclude a solution process with a summary of result resent an acceptable response lid.
	2.8.11.G (Introduced)		Operations with complex numbers	n systems of equations, systems of
	2.8.11.J (Introduced)		Completing the square	Demonstrate the connect on between algebraic equat geometry of relations in the coordinate plane.

	2.8.11.N (Introduced) 2.8.11.Q (Introduced) 2.8.11.S (Introduced)		Quadratic formula and the discriminant Graphing and solving quadratic inequalities Write quadratic functions and models	ic and exponential equations both Represent functional relationships in tables, charts and ies and relationships of functions (e.g. trigonometric, exponential, logarithmic)
13, 14, and 15	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 exponents. Evaluating and graphing polynomial functions. Adding, subtracting, and multiplying polynomials. Factoring and solving polynomial equations. The Remainder and Factor Theorems. Finding rational zeros. Using the Fundamental Theorem of Algebra.	s (e.g., opposite, reciprocal, absolute va g logarithms). December/January ropriate mathematical concepts and d apply them to solving non-routine a ematical terminology, standard not mathematical representations to c concepts, procedures, generalizations, ideas and resu atical procedures and results clearly, correctly. onstrate the connection between algebraic equat geometry of relations in the coordinate plane.
16, 17, and 18	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.	(e.g., opposite, reciprocal, absolute va g logarithms). February appropriate mathematical concepts and ematics and apply them to solving non-routine a rocedures and results clearly, ctly. e the connection between algebraic equat geometry of relations in the coordinate plane. uadratic and exponential equations both l relationships in tables, charts and
19, 20, and 21	2.1.11.A (Introduced)	•	Exponential growth. Exponential decay.	s (e.g., opposite, reciprocal, absolute va finding logarithms). March

	2.5.11.C (Introduced)		Present mathematical procedures and results clearly, The number e.	
	2.8.11.J (Introduced)		veterans day &"wiping of the tears"	ct on between algebraic equat geometry of relations in the coordinate plane.
	2.8.11.N (Introduced)		Solving exponential and logarithmic equations	ratic and exponential equations both
	2.8.11.Q (Introduced)		Represent functional relationships in tables, charts an	
	2.8.11.S (Introduced)		Analyze properties and relationships of functions (e.g trigonometric, exponential, logarithmic).	
	2.11.11.C (Introduced)		Graph and interpret rates of growth/decay	
22, 23, and 24	2.5.11.A (Introduced)	•	Inverse and joint variation.	priate mathematical concepts an April/May mathematics and apply them to solving non-routine a
	2.5.11.C (Introduced)		Graphing simple rational functions.	ent mathematical procedures and results clearly, correctly.
	2.6.11.D (Introduced)		Graphing general rational functions.	e predictions using interpolation, extrapolation, re technology to verify them.
	2.8.11.D (Introduced)		Multiplying and dividing rational expressions.	essions, equations, inequalities, systen inequalities and matrices to model routine and non-ro
	2.8.11.J (Introduced)		Addition, subtraction, and complex fractions.	the connection between algebraic equat geometry of relations in the coordinate plane.
	2.8.11.Q (Introduced)		Solving rational equations.	Represent functional relationships in tables, charts an
	2.8.11.R (Introduced)			Create and interpret functional models.
25, 26, and 27	2.1.11.A (Introduced)	•	An introduction to sequences and series.	May opposite, reciprocal, absolute va g logarithms).
	2.5.11.B (Introduced)		Arithmetic sequences and series.	matical terminology, standard not nd other types of mathematical representations to c concepts, procedures, generalizations, ideas and resu
	2.8.11.A (Introduced)		Geometric sequences and series.	nalyze a given set of data for the existence of a patt algebraically and graphically.
			Infinite geometric series.	

	2.11.11.D (Introduced)	Determine sums of finite sequences of numbers and i Recursive rules for sequences.	