

Foundation of Mathematics

	Name of Course: Foundations of Mathematics Massachusetts and National Standards: <u>AI.A.CED.A.1</u> Create equations and inequalities in one variable and use them to solve problems(Include equations arising from linear, quadratic, and exponential functions with integer exponents)	
	Unit ONE: Equations and Inequalities (in one variable)	
Essential Questions	How can we manipulate an equation to solve for an unknown quantity or value? How can I use equations to model real life?	
Standards	<u>AI.A.CED.A.1</u> Create equations and inequalities in one variable and use them to solve problems(Include equations arising from linear , quadratic, and exponential functions with integer exponents) <u>AI.A-CED.A.2</u> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. <u>AI.A-REI.A.1</u> 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 or refute a solution method. <u>AI.A-REI.B</u> Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters..3	
Concepts and skills	Concepts: Inverse operations can be used to solve for the unknowns in an equation or inequalities	Skills: Solve equations in one variable, including multi-step equations, and equations with absolute value. Solve an equation with two or more variables for one of the variables.

	A solution to an equation is the value or set of values that can be substituted to make the equation true Equations with two or more variables can be manipulated to be written in terms of either (any) of the variables. Mathematical modeling involves creating algebraic representations of quantitative real-world situations.	Solve and graph the solutions to inequalities including multistep, compound and absolute value inequalities.
Content Objectives "I can Statements"	I can explain each step in solving a linear equations I can create and solve linear equations in one variable I can use the properties of equality to solve linear equations with a variable on both side I can use formulas and equations to solve problems	
Assessments, products, vocabulary, practice		
Text, Materials, and Resources		

	Name of Course: Foundations of Mathematics: Grade 9/10 Sub-separate math Massachusetts and National Standards: <u>AI.A.CED.A.2</u> Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales Link to Syllabus
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	Unit Two: Graphing Equations	
Essential Questions	Why are graphs and linear equations important? Can linear functions be used to model real world situations? What do the common characteristics tell us about the function? Why can you relate arithmetic sequences to linear functions? In what ways can you describe common characteristics shown as tables, graphs, and equations? What is slope and why is it important? How can I determine the equation of a line?	
Standards	AREI-10: Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). SID-7: Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. ★ FLE-5: Interpret the parameters in a linear or exponential¹ function in terms of a context. ★ <u>STANDARDS FOR MATHEMATICAL PRACTICE</u> 4. Model with mathematics. 7. Look for and make use of structure.	
Concepts and skills	<i>Students will understand that...</i> real-world situations can be modeled using slope intercept form equations. equations in two variables can be manipulated into a slope intercept form equation to determine characteristics of a situation.	<i>Students will be skilled at (be able to)...</i> graph a linear function: given equation in slope intercept form graph linear equations from standard form find slopes and rates of change

	there are multiple methods of representation: Graph, Chart, Equation. there is a formula to find the slope of a line given two points the relationship between parallel and perpendicular line equations. domain/range of real world linear equations. linear equations can be written given various combinations of information.	graph linear equations in slope-intercept form Write linear equations: given a graph write linear equations: given 2 points write linear equations: given 1 point and a slope write equations to describe lines parallel or perpendicular to a given line. graph linear equations that represent real world situations find x and y intercepts and interpret their meanings in real world context. explore the relationship between constant change and the slope of a line. describe how changing slope and y-intercept affect the graph of a linear function.
Content Objectives "I can Statements"	I can write linear equations in two variables using slope intercept form to represent the relationship between two quantities I can interpret the slope and the intercept of a linear model I can write and graph linear equations in point-slope form I can analyze different forms of a line to interpret the slope and y-intercept of a linear model I can use linear equations in standard form to interpret the x- and y- intercepts I can write equations to represent lines that are parallel and perpendicular to a given line	
Assessments, products,		

vocabulary, practice	
Text, Materials, and Resources	

	Name of Course: Foundations of Mathematics Massachusetts and National Standards: Expressions & Equations 8E B. Understand the connections between proportional relationships, lines, and linear equations. 5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. 6. Use similar triangles to explain why the slope m is the same between any two distinct points on a nonvertical line in the coordinate plane. Derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b. Link to Syllabus
	Unit Three: Ratios & Proportions
Essential Questions	1. What is a ratio vs. a rate? 2. What is proportion? 3. How can I use proportionality to solve real world problems? 4. How can I use proportions to solve similar figure problems? 5. How can I use percent-proportions to solve problems.
Standards	Expressions & Equations 8E B. Understand the connections between proportional relationships, lines, and linear equations. 5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. 6. Use similar triangles to explain why the slope m is the same between any two distinct points on a nonvertical line in

	the coordinate plane. Derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .	
Concepts and skills	<i>Students will understand that...</i> 1. Ratios are a comparison of values 2. Units must match when reducing ratios 3. Unit rates have a denominator of 1 4. Unit rates can be used to compare and determine meaning of data 5. Proportions are equality between ratios 6. Proportionality can be used to find unknown values 7. The product of the means equals the product of the extremes in proportions	<i>Students will be skilled at (be able to)...</i> 1. Write ratios for given information 2. Simplify ratios 3. Compute unit rates 4. Determine if given information is proportional 5. Determine if two ratios are proportional 6. Solve for the unknown in a proportion 7. Use proportions to solve real world problems 8. Use proportions to solve for unknown measurements of similar figures 9. Use percent proportions to solve for unknown 10. Use percent proportions to find percents of increase or decrease
Content Objectives "I can Statements"	I can write ratios for given information I can Simplify ratios I can compute unit rates I can determine if given information is proportional I can determine if two ratios are proportional I can solve for the unknown in a proportion I can use proportions to solve real world problems I can use proportions to solve for unknown measurements of similar figures I can use percent proportions to solve for unknown I can use percent proportions to find percents of increase or decrease	
Assessments, products, vocabulary, practice		
Text, Materials, and Resources		

