Create equations that describe numbers or relationships, using all available types of functions to create such equations (Standards A.CED.1-4).	
Standard III.A.CED.1: Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	
Concepts and Skills to Master	
• Create equations and inequalities in one variable and use them to solve problems of all available types of functions. • Understand the meaning of solutions, including extraneous, in reference to context. • Show solutions to inequalities using set notation, interval notation, and inequalities.	
Related Standards: Current Course	Related Standards: Future Courses
III.A.CED.1, III.A.REI.2, III.A.APR.2, III.A.APR.3	P.N.VM.3

Support for Teachers

Critical Background Knowledge
• Create equations and inequalities in one variable and use them to solve problems (I.A.CED.1, II.A.CED.1, I.A.REI.3, II.A.REI.4) • Create and solve equations (6.EE.7, 7.EE.4a, 8.EE.7) and inequalities (6.EE.8, 7.EE.4b, and 8.EE.7) • Solve exponential equations that can be solved using laws of exponents (I.A.CED.1 and I.A.REI.3) • Write recursive and explicit equations (I.F.BF.1a, I.F.BF.2)
Academic Vocabulary
extraneous solutions
Resources
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5630#71620

Create equations that describe numbers or relationships, using all available types of functions to create such equations (Standards A.CED.1-4).	
Standard III.A.CED.2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	
Concepts and Skills to Master	
• Create and graph an equation to represent relationships between two quantities (include linear, exponential, quadratic, simple rational, square root, cube root, polynomial, trigonometric and logarithmic relationships). • Create and graph absolute value functions using various function types (ie polynomial, logarithmic, trigonometric, etc) and write them as both piecewise defined functions and absolute value functions. • Create equations from various models. • Graph equations on coordinate axes with appropriate labels and scales.	
Related Standards: Current Course	Related Standards: Future Courses
III.A.CED.1, III.A.SSE.1, III.A.SSE.2, III.A.SSE.4, III.F.IF.4, III.F.IF.5, III.F.IF.7, III.F.BF.1, III.F.BF.3, III.F.LE.3	P.A.REI.8, P.A.REI.9

Support for Teachers

Critical Background Knowledge
• Create and graph equations representing linear, exponential, and quadratic relationships between two quantities (I.A.CED.2, II.A.CED.2). • All things linear, exponential and quadratic (Secondary Mathematics I and Secondary Mathematics II) • Choose appropriate scales and label a graph (I.N.Q.1 and I.N.Q.2)
Academic Vocabulary
asymptote, independent and dependent variables, extraneous solution, rational, square root, cube root, polynomial, logarithmic
Resources
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5630#71620

Create equations that describe numbers or relationships, using all available types of functions to create such equations (Standards A.CED.1-4).
Standard III.A.CED.3: 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, maximizing the volume of a box for a given surface area while drawing attention to the practical domain.*
Concepts and Skills to Master
• Write and graph equations and inequalities representing constraints in contextual situations. Pay attention to constraints via the domain, range, asymptotes, and points of discontinuity. • Determine whether a point is a solution to an equation or inequality. • Interpret the meaning and viability of a solution based on the constraints created by the context.

Related Standards: Current Course	Related Standards: Future Courses
III.A.CED.1, III.A.CED.2, III.A.CED.4, III.A.REI.2, III.A.REI.11, III.F.IF.4, III.F.IF.5, III.F.IF.7	P.N.VM.13

Support for Teachers

Critical Background Knowledge
• Represent constraints and interpret solutions as viable or non-viable in a modeling context (I.A.CED.3) • Graph the solutions to a linear inequality in two variables (I.A.REI.12) • Solve systems of equations graphically (8.EE.8) and using various representations (I.A.REI.6 and II.A.REI.7) • Identify key features of functions (I.F.IF.4 and II.F.IF.4) and relate the domain of a function to the relationship it describes (I.F.IF.5)
Academic Vocabulary
constraint, viable, non-viable, asymptotes, points of discontinuity, solution set
Resources
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5630#71620

Create equations that describe numbers or relationships, using all available types of functions to create such equations (Standards A.CED.1-4).	
Standard III.A.CED.4: Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange the compound interest formula to solve for* t: $A = P(1+r/n)^{nt}$	
Concepts and Skills to Master	
• Extend the concepts used in solving numerical equations to rearranging formulas for a particular variable, including rational, square root, cube root, polynomial, exponential, and logarithmic formulas	
Related Standards: Current Course	Related Standards: Future Courses
III.A.CED.4, III.F.IF.8, III.A.SSE.1, III.F.BF.4a	P.F.BF.4

Support for Teachers

Critical Background Knowledge
• Solving linear and quadratic formulas for a quantity of interest (I.A.CED.4, II.A.CED.4)
Academic Vocabulary
quantity of interest, variable, literal equations, formula, rational, square root, cube root, polynomial, logarithmic
Resources
Curriculum Resources: http://www.uen.org/core/core.do?courseNum=5630#71620