Chapter 1 - Introduction to Functions & Graphs

Preparing for Success:
1) Study Habits 1
2) Study Skills 2
3) Be Mathmaticious
4) Feel Your Best
5) Testing Strategies

1.1 Numbers, Data and Problem Solving
1) Classifying Real Numbers
2) Integer Rap
3) Polya's Problem Solving Method
4) STAR Problem Solving Song
5) Percent Change 1
6) Percent Change 2

1.2 Visualization of Data Videos
1) 1.2 E-Book Video Lecture
2) Sets and Relations - Two Variables
3) Visual Representation of Domain and Range

1.3 Functions and Their Representations
1) Initial Definition of a Function
2) Functions and Vertical Line Test
3) Using Functional Notation
4) Understanding Functional Notation
5) Functions and Their Representations
6) Functions Video Lecture

1.4 Types of Functions and Their Rates of Change.
1) Library of Functions - Part 1
2) Library of Functions - Part 2
3) Slope Song
4) Slopes and Rates of Change
5) Slope-Intercept Form of a Line y=mx + b
6) Linear Versus Non-Linear Functions (Expand Window to Full Screen or You Will Miss the Good Stuff)

1.5 Functions and Their Rates of Change
1) Inequalities, Interval and Graphical Notation
2) Inequalities and Interval Notation
3) Definition of Increasing and Decreasing Functions
4) Reading Increasing, Decreasing and Constant Intervals on Graphs
5) Increasing and Decreasing Intervals (Expand Window to Full Screen or You Will Miss the Good Stuff)
6) Intervals of Increase and Decrease, Relative Maximum and Minimums
Chapter 2 – Linear Functions and Equations

2.1 Linear Functions and Their Models
1) Relations, Functions, Domain and Range
2) Domain of a Rational Function
3) Domain of a Radical Function
4) Domain and Range of a Function Graphically
5) Modeling with a Linear Function
6) Linear Functions
7) Modeling with Linear Equations
8) Piecewise-Defined Functions 1
9) Piecewise-Defined Functions 2
10) Piecewise-Defined Functions 3
11) Piecewise-Defined Functions 4
12) Evaluating Piecewise-Defined Functions

2.2 Equations Of Lines
1) Slope Dude
2) Understanding Positive, Negative, Zero, and Undefined Slopes
3) Mind Bite Points to Lines Introduction
4) Graphing Lines Summary
5) Graphing by Finding the X- and Y-Intercepts
6) Graphing Horizontal and Vertical Lines
7) Writing the Equations of Horizontal and Vertical Lines
8) Writing Equations of Lines Examples
9) Writing Equation of a Line Given Two Points
10) Using the Point-Slope Form Given Two Points
11) Parallel, Perpendicular, or Neither?
12) Parallel or Perpendicular to Another Given Line
13) Point-Slope Form to Find a Perpendicular Line
14) Using $y = mx + b$ form given two points (Alternative Method)
15) Summary of All Three Forms of a Line
16) Understanding Linear Functions
17) Recognizing Linear Functions
18) Functions and Their Representations
19) Graphs of Basic Functions
20) Linear Functions and Models
21) What is Direct Variation?
22) Direct Variation Introduction
23) Example of Direct Variation
24) Using Direct Variation to find the Cost of Gasoline
2.3 Linear Equations
1) The Infamous Function Machine
2) Independent and Dependent Variables Song
3) Introduction to Functions and Relations
4) Slope-Intercept Form of a Line Real World Modeling
5) Formulas
6) Understanding Linear Functions
7) Recognizing Linear Functions
9) X Finds Out His Value
10) Solving One-Step Equations
11) What is a Zero of a Function?

2.4 - Solving Inequalities
1) Basic Inequalities Graphing with AND and OR
2) Solve and Graph Linear Inequalities
3) Solve and Graph Inequalities Examples
4) Solving a Three-part Inequality

2.5 - Absolute Value Equations and Inequalities
1) Basic Absolute Value Equations
2) Solving Absolute Value Equations and Inequalities
3) Solving Absolute Value Equations and Inequalities Examples
4) Math By Fives Absolute Value Inequalities
5) Equations Involving Absolute Value
6) Solving an Absolute Value Inequality with >
Chapter 3 – Quadratic Functions and Equations

1) Parabolas-A Quick Look
2) Introduction to Parabolas and Quadratic Equations
3) Recognizing Quadratic Equations
4) Three Forms of Quadratic Equations
5) Exploring Quadratic Graphs
6) The Vertex and Axis of Symmetry
7) Parabolas - Interactive Activity

3.1 Quadratic Functions and Models

1) Exploring Dilations of Quadratic Equations
2) Completing the Square 1
3) Completing the Square 2
4) Completing the Square 3
5) Vertex Formula
6) Using the Vertex Formula to Complete the Square
7) Modeling with the Vertex Form - Interactive Activity

3.2 Solving Quadratic Equations

1) Vocabulary of Solving Quadratics
2) Zeros of Quadratic Equations by Factoring
3) Zeros of Quadratic Functions
4) Solving Quadratic Using the Zero Property and Factoring
5) Zero Property Interactive Activity
6) Quadratic Formula
7) Solving Quadratic Using Quadratic Formula
8) Square-Root Property
9) Solving by Completing the Square
10) Solving Quadratic Using Completing the Square
11) Square Root Property Interactive Activity
12) Modeling Application Interactive Activity

3.3 Complex Numbers

1) The Imaginary Number Movie
2) Introduction to the Complex Number System
3) Complex Numbers Part 1
4) Complex Numbers Part 2
5) Complex Number Operations
6) Complex Conjugates
7) Complex Number Lecture
8) Quadratic Equations with Complex Solutions
9) Subtracting Complex Numbers

3.4 Quadratic Inequalities

1) Solving and Graphing Quadratic Inequalities
2) Algebraic Solutions to Quadratic Inequalities
3) Common Mistake Solving Algebraic Quadratic Inequalities
4) Solving Polynomial Inequalities
Chapter 4 – More Non-Linear Functions and Equations

4.1 - More Non-Linear Functions
1) Introduction to Polynomials 1
2) Introduction to Polynomials 2
3) Recognizing Polynomials
4) Evaluating Polynomials
5) Understanding Functional Notation
6) Identifying Extrema 1
7) Identifying and Describing Extrema 2
8) Understanding Extrema 3
9) Extrema Graphically by Leading Term

4.2 - Polynomial Functions & Models
1) Graphs of Polynomial Functions
2) End Behavior of Polynomials Intro 1
3) End Behavior of Polynomials 1
4) End Behavior of Polynomials 2
5) End Behavior of Polynomials 3
6) Degree, Turning Points and End Behavior
7) Turning Points, X-Intercepts, and Graphs
8) Making the Connection - Zeros, Solutions, and X-intercepts
9) Introduction to Piecewise Graphs
10) Graphing Piece-Wise Functions

4.5 Fundamental Theorem of Algebra
1) Fundamental Theorem of Algebra 1
2) Understanding the Fundamental Theorem of Algebra 2
3) Finding Polynomials Using the Zeros
4) Imaginary Solutions Animation Link

4.7 Variation
1) Introduction to Variation
2) Direct and Inverse Variation 1
3) Direct and Inverse Variation 2
4) Direct Variation Example 1
5) Variation Examples 2
6) Inverse Variation Animation Link
Chapter 5 – Exponential and Logarithmic Functions

5.1 The Algebra of Functions
1) **Combining Functions Using Addition (Sum)**
2) **Combining Functions Using Subtraction (Difference)**
3) **Combining Functions Using Multiplication (Product)**
4) **Combining Functions Using Division (Quotient)**
5) Composition of Functions

Chapter 5.2 Inverse Functions
1) [http://www.youtube.com/watch?v=YdRXbUIM8KQ](http://www.youtube.com/watch?v=YdRXbUIM8KQ)
2) [http://www.youtube.com/watch?v=Gtly4wRsLuc&feature=related](http://www.youtube.com/watch?v=Gtly4wRsLuc&feature=related)
3) [http://www.youtube.com/watch?v=8VfIhXtZH5k&feature=related](http://www.youtube.com/watch?v=8VfIhXtZH5k&feature=related)
4) [http://www.youtube.com/watch?v=dBKM7E0-kKY](http://www.youtube.com/watch?v=dBKM7E0-kKY)

5.3 Exponential and 5.4 Logarithmic Expressions and Models
1) [http://www.youtube.com/watch?v=xp1TeBfkLPq](http://www.youtube.com/watch?v=xp1TeBfkLPq)
2) [http://www.youtube.com/watch?v=pcKtySwy1aM](http://www.youtube.com/watch?v=pcKtySwy1aM)
3) [http://www.youtube.com/watch?v=MSsQmPd5ZA&feature=relmfu](http://www.youtube.com/watch?v=MSsQmPd5ZA&feature=relmfu)
4) [http://www.youtube.com/watch?v=FXbNeYCxZ8s&feature=relmfu](http://www.youtube.com/watch?v=FXbNeYCxZ8s&feature=relmfu)
5) [http://www.youtube.com/watch?v=6kHo9Strr7s&feature=fvsr](http://www.youtube.com/watch?v=6kHo9Strr7s&feature=fvsr)
6) [http://www.youtube.com/watch?v=KmIK6qYVpAU](http://www.youtube.com/watch?v=KmIK6qYVpAU)
7) [http://www.youtube.com/watch?v=szWwTZoH3-8](http://www.youtube.com/watch?v=szWwTZoH3-8)
8) [http://www.youtube.com/watch?v=2h1fnw6Yhgo](http://www.youtube.com/watch?v=2h1fnw6Yhgo)
9) [http://www.youtube.com/watch?v=TOoXH_IwUx0&feature=related](http://www.youtube.com/watch?v=TOoXH_IwUx0&feature=related)

5.5 Properties of Logarithms
1) [http://www.youtube.com/watch?v=4HftR1d8laU&feature=related](http://www.youtube.com/watch?v=4HftR1d8laU&feature=related)
2) [http://www.youtube.com/watch?v=F_kwYq8WghE&feature=related](http://www.youtube.com/watch?v=F_kwYq8WghE&feature=related)
3) [http://www.youtube.com/watch?v=fBeZvL7vpY&feature=related](http://www.youtube.com/watch?v=fBeZvL7vpY&feature=related)
4) [http://www.youtube.com/watch?v=YuzHFzn2F38&feature=related](http://www.youtube.com/watch?v=YuzHFzn2F38&feature=related)
5) [http://www.youtube.com/watch?v=Sxy0ZvFgAPE&feature=related](http://www.youtube.com/watch?v=Sxy0ZvFgAPE&feature=related)
6) [http://www.youtube.com/watch?v=LJ0RtM_QpMw&feature=related](http://www.youtube.com/watch?v=LJ0RtM_QpMw&feature=related)

5.6 Solving Exponential and Logarithmic Equations
1) [http://www.youtube.com/watch?v=U125h7w-iIA&feature=related](http://www.youtube.com/watch?v=U125h7w-iIA&feature=related)
2) [http://www.youtube.com/watch?v=YML1Lf-apLU&feature=related](http://www.youtube.com/watch?v=YML1Lf-apLU&feature=related)
3) [http://www.youtube.com/watch?v=Xg1eit51xk](http://www.youtube.com/watch?v=Xg1eit51xk)
4) [http://www.youtube.com/watch?v=_FZivq1rG4&feature=related](http://www.youtube.com/watch?v=_FZivq1rG4&feature=related)
5) [http://www.youtube.com/watch?v=NR=1&v=dJR8DkQ_UU0](http://www.youtube.com/watch?v=NR=1&v=dJR8DkQ_UU0)
6) [http://www.youtube.com/watch?v=vg06fO-ZFQM&feature=related](http://www.youtube.com/watch?v=vg06fO-ZFQM&feature=related)
Chapter 6 – Systems of Equations
6.3 Systems of Equations in Three Variables

1) Solving Systems of Equations Song
2) Graphical Solutions to Systems of Equations 1
3) Graphical Solutions to Systems of Equations 2
4) Substitution Method for Systems of Equations 1
5) Substitution Method for Systems of Equations 2
6) Elimination/Addition Method for System of Equations 1
7) Elimination/Addition Method for Systems of Equations 2
8) Elimination/Addition Method for Systems of Equations 3
9) Solving Systems of Three Equations by Elimination 1
10) Solving Systems of Three Equations by Elimination 2

FINAL EXAM REVIEW VIDEO LINK
http://cms.uhd.edu/qep/algebra (click on video recording – last entry on MATH 1301 page)