

## **Chapter 1: Linear and Quadratic Functions**

### Section 1.1: Points and Lines

- Solving systems of equations algebraically
  - Solution is a coordinate (point of intersection)
  - Solve by canceling variables
- Distance formula
- Midpoint formula

### Section 1.2: Slopes of Lines

- Slope Formula (change in y over the change in x)
- Parallel lines: same slope
- Perpendicular lines: opposite reciprocals

### Section 1.3: Finding an equation of a line

- General or Standard Form  $Ax + By = C$ 
  - A, B, and C are integers and A is positive
- Slope-intercept Form
- Point-Slope Form
- Intercept Form
- Know how to find a perpendicular bisector

### Section 1.4: Linear Functions and Models

- Evaluating functions ex: If  $f(x) = 2x + 1$  find  $f(2)$
- Finding zeros of a function by setting the equation equal to zero

### Section 1.5: The Complex Numbers

- $i = \sqrt{-1}$  and  $i^2 = -1$
- Imaginary number  $a + bi$  ( $a$  is the real part and  $b$  is the imaginary part)
- If  $a + bi$  is a root so is  $a - bi$

### Section 1.6: Solving Quadratic Equations

- The root, or solution, is where the graph crosses the x-axis
- Methods: Factoring, Completing the Square, and Quadratic Formula
  - Try to factor first
  - If not factorable then use the Quadratic Formula
- Discriminant (2 imaginary roots, 2 real roots, or 1 real root)

### Section 1.7: Quadratic Functions and their Graphs

- Opening up or down
- Axis of Symmetry
- Vertex

### Section 1.8: Quadratic Models

- Ex: Given  $f(0) = 5$ ,  $f(1) = 10$  and  $f(2) = 19$ , find a quadratic function

## **Chapter 2: Polynomial Functions**

### Section 2.1: Polynomials

- Degree and Name (ex:  $D = 3$ , cubic)
- Leading coefficient, leading term, degree, constant
- If  $P(x) = 0$  then  $x$  is a root of  $P(x)$  and a zero of the function
- Synthetic Division – use to evaluate a polynomial

### Section 2.2: Synthetic Division

- The Remainder Theorem
- The Factor Theorem
- Finding the quotient and remainder

### Section 2.3: Graphing Polynomial Functions

- Shape/curve of linear, quadratic, cubic, and quartic functions
- Double roots and triple roots
- Quadratic and Quartic functions open up or down

### Section 2.4: Finding maximums and minimums of polynomial functions

- Maximizing Area
- Finding the minimum value of a quadratic equation

### Section 2.6: Solving Polynomial Equations by Factoring

- Rational Root Theorem
- Possible roots are  $\frac{p}{q}$  where  $p$ : factors of the constant and  $q$ : factors of the leading coefficient

### Section 2.7: General Results for Polynomial Equations

- The Fundamental Theorem of Algebra
- The Complex Conjugate Theorem
- If  $a + \sqrt{b}$  is a root so is  $a - \sqrt{b}$
- If  $P(x)$  is a polynomial of odd degree, then  $P(x)$  has at least one real root
- Sum of the roots formula
- Product of the roots formulas

*Look at your Chapter 1 - 2 Review Sheet (more detailed)*

## **Chapter 3: Inequalities**

### Section 3.1: Linear Inequalities; Absolute Value

- Solving inequalities is similar to solving equations
- Absolute value – “and” statement / “or” statement

### Section 3.2: Polynomial Inequalities in One Variable

- Shading above or below the graph
- Dashed line ( $>$  or  $<$ ) OR Solid line ( $\geq$  or  $\leq$ )
- Find the zeros and test the intervals

### Section 3.3: Polynomial Inequalities in Two Variables

- Graph two or more inequalities and shade the intersection

### Section 3.4: Linear Programming

- Look at you 3.4 notesheet, homework, and review sheets

## **Chapter 4: Functions**

### Section 4.1: Functions

- Domain (independent) and Range (dependent)
- Each x-value corresponds to exactly one y-value
- The Vertical Line Test

### Section 4.2: Operations on Functions

- Sum, Difference, Product, and Quotient
- When taking the difference remember to distribute the negative sign through
- Composite Functions  $(f \circ g)(x) = f(g(x))$ 
  - DO NOT multiply by x
  - The (x) is what to plug into the function

### Section 4.3: Reflecting Graphs; Symmetry

- Reflection of the x-axis, y-axis,  $y = x$  line, and the origin
- Axis of symmetry and Point of Symmetry formulas
- Deciding if a graph is symmetric to the x-axis, y-axis,  $y = x$  line, and/or the origin

### Section 4.4: Periodic Functions

- Fundamental period
- Amplitude formula
- Vertical stretch or shrink
- Horizontal stretch or shrink

### Section 4.5: Inverse Functions

- Three steps to find the inverse
- Notation: the inverse of  $h(x)$  is  $h^{-1}(x)$
- Horizontal Line Test
- One – to – one functions

## Chapter 5: Exponents and Logarithms

### Section 5.1: Growth and Decay: Integral Exponents

- Laws of Exponents
- Zero Power
- Negative Powers

### Section 5.2: Growth and Decay: Rational Exponents

- Growth Model and Decay Model
- Rational exponent  $x^{m/n}$  where  $n$  is the value of the root and  $m$  is the power

### Section 5.3: Exponential Functions

- Growth and Decay is dependent on the b-value (note sheet)

### Section 5.4: The Number e and the Function $e^x$

- Compound Continuously Formula
- The approximation of e







### Section 5.5: Logarithmic Functions

- A logarithm is an exponent
- Common logarithm
- Natural logarithm

### Section 5.6: Laws of Logarithms

- Four laws

Also ...

-  Look over all notes
-  Look at your past homework assignments
-  Use your blue chapter note cards (1 - 5) to create your final notecard
-  You may use a full sheet of paper (both sides 8.5x11) for your final note card - yellow sheet that was given to you
-  Take advantage of resource time
-  **STUDY!**