

# [COLLEGE ALGEBRA EXAM II REVIEW TOPICS]

(use this to make sure you are ready)

Below are the topics we have covered in the course so far listed by chapter.

## (chapter 4) – More Nonlinear Functions And Equations

### (4.1) – More Nonlinear Functions and their graphs (page 232)

- Know and understand the definition of a polynomial function
- Know how to find local and absolute extrema
- Be able to identify if functions are odd or even by
  - examining the graph of the equations and checking its symmetry; or
  - using the definitions of odd and even ( $f(-x) = -f(x)$  and  $f(x) = f(-x)$  respectively)

### (4.2) – Polynomial Functions and Models (page 243)

- Know how to determine a polynomial's end behavior (falls to left, rises to right, etc...)
  - know how an even degree poly function behaves
  - know how an odd degree poly function behaves
  - be familiar with limit notation ( $f(x) \rightarrow \infty$  as  $x \rightarrow \pm\infty$  etc...)
- Know how to determine a function's minimum degree by looking at the graph (using turning points and x-intercepts)
- Know how to determine whether a polynomial's leading coefficient is positive or negative

### (4.3) – Division of Polynomials (page 260)

- Know how to divide polynomials using
  - long division
  - synthetic division
- Understand how dividing polynomials is useful in determining the “zeros” of a polynomial

### (4.4) – Real Zeros of Polynomial Functions (page 267)

- Understand the importance of the factor theorem
- Know how to write a polynomial in complete factored form
- Know how to find the multiplicities of a function given its graph and how to write multiplicities in the complete factored form
- Know how to use the rational zeros test to find the rational zeros of a polynomial function
- Know how to find the number of possible positive zeros and the number of possible negative zeros using Descartes' Rule of Signs

### (4.5) – The Fundamental Theorem of Algebra (page 283)

- Know what the fundamental theorem of algebra says, and why it is so important
- Understand that ANY polynomial function can be written in complete factored form using complex numbers
- Be able to find the complete factored form of polynomials
  - **This may require using the rational zeros test to find any real zeros, then dividing through using that zero to simplify the original polynomial into something you may be able to factor**
  - Be able to write complete factored form given the leading coefficient and a few zeros
- Know the complex conjugate zeros theorem

**(4.6) – Rational Functions and their Models (page 289)**

- Know what a rational function is and how to find it's domain
- Know how to find vertical and horizontal asymptotes given
  - the functions graph
  - the equation of the function
- Know how to graph rational functions by hand (using the 7 step process)
  - remember that rational functions tend towards their asymptotes

~~**(4.7) – More Equations & Inequalities (page 307)**~~

- ~~○ We only covered one topic in this section: direct variation with the nth power (page 310)~~

**(4.8) – Radical Equations and Power Functions (page 322)**

- Know how to use the properties of rational exponents to simplify radical expressions
- Know how to solve radical equations
- Know what power functions and root functions are and how to find their domains
- Know how to solve equations with rational or negative exponents
- Understand how to find the “best fit” curve of data using Power Regression

**(Additional Thoughts)**

There is only 50 minutes to take the exam – so clearly I won't be able to put ALL of the stuff on this review on the exam itself. Remember that there are 3 main resources I use for my exams:

- i) Notes
- ii) Homework
- iii) Review (both online and in class)

Please make sure you are as ready as you can be! My general advice is to **put yourself in a testing situation**. I think that a lot of students may study for an exam, but never actually set aside 50 minutes to do 16 or 17 problems – forcing themselves to be in a timed situation. That would be analogous to running a race but never running a tempo run. **Make sure you try to do a set amount of problems in 50 minutes** – that way when you get to the exam, the time constraint isn't so much stress!