Wilfrid W. Csaplar Jr. College Algebra Review Sheet for Exam 1

This review sheet is intended to cover everything that could be on the exam; however, it is possible that I will have accidentally left something off. You are still responsible for everything in the chapters covered except anything that I explicitly say you are not responsible for. Therefore, if I left something off of this sheet, it can still be on the exam. There will be no multiple-choice questions. Most of the questions will be like the ones in the homework assignments, and possibly a few definition questions, but I am more likely to ask questions that make you use the definitions rather than recite them. I will probably ask one of the questions from the book at the end of the chapters.

The review session will be at a time to be determined in class, probably Sunday 8/30.

Chapter 0.2: Know the following properties of addition and multiplication of real numbers, **closure, commutativity, associativity, identity, inverse, subtraction,** and **division.** Know how to **distribute** and **factor**. *Note that if you have (a+b)(c+d), you will need to FOIL. That is First, Outer, Inner, and Last. So, you will get ac+ad+bc+bd. Similarly,* $(a+b)^2 = a^2 + ab + ab + b^2 = a^2 + 2ab + b^2$. Understand the properties of **zero**. Know the properties of **negatives**. *The two properties students are most likely to have problems with are* ***distributing negatives*** *and* ***factoring negatives****. The former is -(a+b) = -a -b and -(a-b) = -a + b. The latter is -a - b = -(a+b) and b-a = -(a-b).* For fractions, understand **identity properties, equality, muliplication, division, addition, subtraction, equivalent fractions,** and **reducing fractions**. Some comments, *multiplication does not need a common denominator. For division, watch out for division by 0. Addition and subtraction must have a common denominator. The best way to find a common denominator is to factor both denominators. List all the factors. If a factor appears in both, only list it the one time. The other way is to multiply the denominators to get a common denominator. That method is simplest, but often will mean you will have to reduce your fraction later.* For properties of **integer exponents**, know the **product rule, quotient rule, power rule, negative exponents, zero powers** and **powers of zero.** *The places people tend to forget are division and negative exponents, which are really the same. Remember* $x^{-2} = 1/x^2$. For **order of operations**, *parentheses and other similar grouping symbols are first. After that, it is in the reverse order you learned them in elementary school. You learned + and - then * and / then exponents, so do it exponents, * and /, and then + and -. If you have several of the same in a row, go from left to right.* **Scientific notation** is written as n.d Ek. Where n is a one digit integer, d is the decimal(s), and Ek represents 10^k. *The k represents how many places you need to move the decimal. If k is positive, move the decimal right and if k is negative, move the decimal left. So 3.21 E1 = 32.1 and 3.21 E-1 = 0.321.* Understand how to calculate **nth roots**. *Since and nth root is just an exponent of 1/n, all the properties of integer exponents apply to roots.* Understand why the nth root of $x^n = x$ and why if n is even, then we need $x > 0$.

Chapter 0.8: For reducing fractions with equations in the numerator and denominator, you CANNOT cancel a term in the numerator with a term in the denominator if either of them are added or subtracted from another term. You must factor both before reducing. See Page 96. *One important thing to note, if you cancel something from the denominator, write down the value of x which could not have been there. For example, if you have* $\frac{8(X-4)}{(X-4)(X+5)}$ *and you*

cancel the (X-4)s, then you need to write down that X≠ 4. Otherwise, at the end, you may end up with 4 as the answer, but if you wrote that X cannot be 4, you will realize that there is no solution. I would read all of the examples and make sure you know the ***quadratic formula****. One thing to note. On Page 105, at the top, they leave the square root in the denominator. Later in the chapter they show how to get rid of it. You should not leave a radical in the denominator. Note at the bottom of Page 105, that they show that x has two values.*

Chapter 0.9: Know how to separate **n^{th} roots** and **n^{th} powers**. *If n is even, you need to add absolute value but not if n is odd. You cannot distribute either the power or the root. I would read all of the examples. Especially the ones on Page 113.* Know how to **extract n^{th} roots.** *Two bits of caution. First, if the root is even, then you need to add ±. If you square both sides of an equation (or cube etc.) then you could inadvertently add extraneous roots. You must test the answers in your original equation.* If you have a square root in the denominator, you need to multiply both the numerator and denominator by **the conjugate**. For $a+b\sqrt{c}$ the conjugate is $a+b\sqrt{c}$.

Non-graded Homework Assignment #4A to be reviewed with Assignment #4.

Page 109, #37
Page 123, #6, 9, 15, 21, 26, 30