Fall MS 101 STUDY GUIDE 2004

Sect/Pg	Problems	Problem Type
1.1/ 10	55,59,67	**Integer Order of Operations**
1.2/ 19	41,49,61,69	**More Order of Operations**
WS#1	1,11,36,39,46	**More Order of Operations**
1.3/ 28	27,29,41,45	**Order of Operations with Exponents**
1.4/ 36	15,21,41,65,69,75	**Simple Algebraic Expressions, Evaluating with Substitution, English Phrases Translated into Algebraic Expressions**
WS#2	2,3,28,60,72	**Order of Operations and Parentheses**
2.1A/ 50	11,27,39,49	**Solve Linear (1st degree) Equations with Integers**
WS#4	6,8,19,26,29,44,51,66,74,75,92	**Solve Basic Linear Equations** (These are problems of types from 2.1A; 2.2A; 2.3A; & 2.4A, but basically short .. Good practice.)
2.1B/51	51,53,55,57	**Word Problems: "Number Type"**
2.2A/58	3,9,29,37	**Solve 1st Degree Equations with Fractions:** Remember you can **multiply** both sides of the equation by the **LCD** to "remove the fractions" from the equation. The safest way is to multiply **each term** by the LCD.
2.2B/ 59	41,45,53	**Word Problems: "Number Type" with Fractions.** Remember that Fractions "Never stand alone". For example one-half **of** a number indicates to **multiply** the number by 1/2.
2.2C/ 59	43,47,55	**Word Problems: "Geometry" with Fractions**
2.3A/ 66	1,9,15,23	**Solve Decimal Equations:** Same idea as the fractional equations... You can multiply each term by the correct multiple of 10 to "remove the decimal". Be careful to "add zero's" when needed in this process.
2.3B/ 67	29,35,41,43	**Word Problems: Percents & Decimals**
WS#15	1,4,11,13	**Word Problems: Percents & Decimals**
2.4A&B/ 77	1,7,9,19,25	**Symbolic Linear Equations: Solving for One Variable "in Terms of" or by Substitution:** Solve for the unknown cited and treat the other unknowns "like they were constants", adding, subtracting, multiplying and dividing by them as needed just like you would if they were numbers. **Warning:** You have not "solved for the given unknown if it is "in the answer" (Example: **x** = 3**x** + c is NOT solved for **x.**)
2.4C/ 78	31,45	**Symbolic Linear Equations that Require Factoring to SOLVE:** Similar to the above problems but these have more than one term left with the desired unknown once all possible terms have been combined. Have all terms that have the desired unknown on one side of the equation and all other terms on the other side of the equation. Then the desired unknown can be **factored out** as a common factor on that side. Divide both sides by the quantity left in ( ), and you will have solved for the desired unknown.
WS#20	2,5,9,44,45	**Symbolic Linear Equations that Require Factoring to SOLVE**
2.4D/ 78	47,48	**Word Problems: "Geometry"**
2.4E/78	49, 51	**Word Problems: Percents & Decimals:** Remember that percents must be changed to decimals by shifting the decimal place 2 positions to the left. Also, remember that **"percents never stand alone"**: A percent **OF something** indicates to **multiply** the decimal equivalent times that **something**.
2.4G/78	59, 61	**Word Problems: Mixture**
WS#16	2,3,6	**Word Problems: Mixture**
2.5A/ 85	1,7,11,13,17	**Linear Inequalities: Notation:** Se sure you can use the "new" Number Line notation and that you can put these into Interval Notation, and vice versa.
2.5B/ 85	31,37,45,59,63	**Linear Inequalities: Solving:** Remember to keep the inequality symbol facing the same direction as you go, solving the same way you would solve a linear equation, **except**: When you **multiply or divide by a negative number,** then you **must reverse the direction of the inequality symbol**. Be able to put your answer in any of the 3 forms (Inequality, Number Line, or Interval Notation.)
3.1/114	Also **WS#6**)	**Polynomial Sums & Differences**
3.2/120	5,33,49,51,53,63,65	**Monomial Products & Quotients: USING EXPONENT RULES**

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3.3/127	3,9,21,25,37,55,63	**Multiplying Polynomials (Includes FOIL)**
WS#10	1,9,25,42,56,60 (See also **WS#8**)	**Multiplying Polynomials (Includes FOIL)**
WS#7	3,12,24,29,30,47	**A mixture of Multiplying and Adding Polynomials**
	WARNING**	**On the Final: Be sure to pay attention to directions as to whether you are to JUST FACTOR, or SOLVE an equation so that you do NOT confuse these problems from 3.4 - 3.7!**
3.4A&B/135	25,39,45,51,55	**FACTORING: by Common Factors & by Grouping**
3.4C/136	65,71,75	**SOLVING EQUATIONS BY FACTORING**
3.5A&B/142	5,15,25,39	**FACTORING: Difference of Squares** (Difference of Cubes may be used for Bonus)
3.5C/ 143	57,61,63,67	**SOLVING EQUATIONS BY FACTORING**
3.6A/151	1,17,25,39,47,53; See also **WS#11**	**FACTORING: FOIL Type**
3.6B/151	57,61,67,73,77,85,93	**FACTORING: All Methods:** Remember to always: **1.** Check for **Greatest common factor first,** once that is done... **2. Count the number of terms** to help identify the factoring pattern: **Two terms:** Difference of squares or difference of cubes (the latter will NOT be on the Final); **Three terms:** Foil factor (or trinomial factoring.); **Four terms:** Possibly by grouping. Always factor COMPLETELY! **See warning** above.**
WS#12	1,5,24,29,40,47	**FACTORING: All Methods**
3.7A/157	1,17,27,41,53	**SOLVING EQUATIONS BY FACTORING:** These are equations that have a 2nd degree term or higher. The idea is to: **1.** get your **equation set = 0** with terms combined, etc., **2.** Then **completely factor** that expression. Once it is in factored form, **3. set each factor = 0**, since the only way a product can be 0 is for one or more of the factors to be 0. For most of these problems, these factors will either be numbers that can **not** be 0, or will be simple linear expressions that can be easily solved. **See warning** above.**
3.7B/157	55,57,59,61	**Word Problems: Not assigned.. Possible Bonus Problems.**.Equation found will be solved by factoring methods.
4.1/171	13,17,21,29,45	**Simplifying Rational Expressions (Algebraic Fractions):** Remember you can only "cancel" factors (things that are multiplied both top & bottom. **Hint**: This requires that there can be only **ONE term top and bottom before cancellation** can be considered. Remember proper exponent rules, and where there are **polynomials**, get these **into completely factored form** in order to simplify.
4.2/177	15,21,25,27,39	**Simplifying Rational Expressions: Multiply & Divide:** Same idea as above. Remember to **invert to multiply in the case of division before** doing any **cancellation**. Once things are in factored form and multiplied (Remember this means there will only be one term.), you can **"cancel" same factors top to bottom** whether they are in the same fraction or in a different one, as long as one is on top and one is on bottom.
4.3/185	9,15,23,31,41,51,63; See also **WS#21**	**Simplifying Rational Expressions: Add & Subtract:** This is just like adding and subtracting number fractions, you must get a **common denominator** and it is very important to get the **L**east **C**ommon **D**enominator. Remember in **"creating" the LCD**, you are essentially **multiplying each fraction by an equivalent of "one"** so that the value of your expression does not change. **Warning:** Do **not** confuse this with **solving equations** that contain **fractions**. In Section 2.3, you could multiply by the LCD and remove the fractions, but **now** you are Simplifying, and **if you multiply by the LCD, you are changing the value of your expression.. BAD!**

Sect/Pg	Problems	Problem Type
5.1A/232	7,25,35,37,39	**Integers as Exponents with Numbers:** Exponent rules are the same even though we are now considering negative integer exponents also. The **negative exponent** just means to take the **inverse** of whatever is raised to that exponent. If everything is multiplied and/ or divided, this essentially means that you can "move" a factor with its exponent "down" or "up" in a fraction by changing the sign of its exponent. Refer to class notes for rules and examples. **Warning:** A **negative exponent** does **NOT** make the **number negative.** (Example 3 "to the -1 power" does NOT equal -3... It is equal to 1/3. Be sure to "evaluate" all numbers raised to exponents... That is, **get a number equivalent.** (Example, don't leave 5 raised to the 3rd power... This should be evaluated as 125.)
5.1B/232	43,53,57,59,71	**Integers as Exponents with Algebraic Expressions:** Same principles as above, except that you will not be able to evaluate a variable raised to a power. **NEVER leave a negative exponent** in an answer.
5.1C/232	75,81,83	**Integers as Exponents with Algebraic Expressions with 2 Terms:** When more than one term is involved, then you are not in factored form. First, **change** each factor to the **correct position with a positive exponent** instead of a negative one. Now, it will probably **"look like" an addition of fractions** problem like those in 4.3. Proceed as with those problems.
WS#18	3,4,5,6,7,11,14,16,19,23,24,28,36,39,43	**Basic Exponent Problems**
5.2A/243	1,3,5,7,15	**Basic Radicals with Numbers:** These "come out of the radical exactly."
WS#3	2,6,8,11,19,20,39,53	**Basic Radicals with Numbers**
5.2B/243	23,31,35,41	**Simplifying Radicals with Numbers:** Here, "split the number into factors" so that one is a perfect square (hopefully the largest one possible.) and the other is not. Take the square root of the perfect square and multiply it on the "outside" and leave the other number "inside." If you did not find the largest perfect square the first time, you will have to repeat this process.
WS#13	2,8,32,41,43	**Simplifying Radicals with Numbers**
5.2C/244	45,51,61,69,73	**Simplifying Radicals: Rationalizing Denominators with Square & Cube Roots with Numbers Only.** To **"rationalize the denominator"** means to "remove the radical(s) from the denominator". This must be done in such a way that the **"value of the expression" is not changed.** Same concept of not changing value as we faced with fraction expressions, so whatever we do here to change the form will be done by **multiplying by an equivalent of "one"** so that value is not changed. The idea in both the square root and cube root case is to figure out **what to multiply the denominator by so as to "create" a perfect square or a perfect cube,** respectively, under the radicals, so that the radical can then be simplified "exactly, " thus "removing" the radical. Remember that you must multiply square root by square root and cube root by cube root, in order to be able to multiply the "insides" as desired; and you **must multiply the "top" by the same thing as the "bottom",** so that you have merely multiplied by "one."
5.3A/249	1,7,9,11	**Simplifying Radicals: Sums with Numbers Only:** You will just be simplifying radicals as in 5.2B, but you will find that the results are just **like having "like terms",** like adding 2x + 5x = 7x, except the "x" is a common square root or a cube root.
WS#5	3,8,9,15,17,18,19,23,31,33,50,51	**Exact Radical Problems:** Practice with different combinations of operations with roots, but all the answers are "no radicals." **Evaluating "exact radicals" with variables involved:** Here we are taking square or cube roots of a variable, say x, raised to a power that will come out of the radical exactly. The square root of x raised to the **n** power can be written as x raised to the **n/2** power; thus if **n** is an even number, the expression "comes out" of the radical exactly. Similarly, the cube root of x raised to the **n** power is x raised to the **n/3** power, so in the case that **n** is a multiple of 3, this expression will "come out" of a cube root exactly.

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5.3B/249	27,29,37,55	**Simplifying Radicals: Algebraic, & Rationalizing Denominators with Algebraic Square & Cube Roots:** As in the above discussion: When we are faced with the situation of the exponent **n** not being the correct multiple to come out of the radical exactly, we pick the largest integer less than **n** that is the correct multiple, then use the exponent rule to express x raised to the **n** power as x raised to this next integer times x raised to whatever is necessary to "get back up" to "x to the **n**" (Example cube root of x raised to the 14th power: The largest integer less than 14 that is divisible by 3 is 12. Thus x to the 14th = x to the 12th times x to the 2nd. Cube root of x to the twelth is excatly x to the 12/3 or x to the 4th, and the x to the 2nd stays under the cube root. Same idea as with numbers is used for rationalizing.
5.7/273	3,9,13,21,29	**Scientific Notation.** Be able to convert from Ordinary Decimal to Scientific Notation and vice versa.
7.2/357 7.5B/387	7,17,25,29,31xxxxxx xx49 (from 7.5)	**Graphs of Lines:** You will have to identify both x- & y-intercepts. You need to find these points algebraically .... Not estimating through the graph. You will also have to find the slope of the line. You will have to graph 3 points, including the x- & y-intercept. May use the slope to find the 3rd point. or "an x,y chart". Also be able to identify equation & slope of horizontal &vertical lines
WS#14	1,5,7,8	Uses problems in 7.2 to do the following: Putting **equations** of lines into **Slope-Intercept form**; finding the **slope**; finding the **slope** of any **perpendicular** line; finding **x- and y-intercepts.** Also be able to **identify intercepts from a graph** as we did on **PT#7, problems #20 & #21.**
7.3/364	1,5,13	**Graphs of Linear Inequalities in Two Variables (Shade Graphs):** (Directions will be the same as on Major Test #2 ... Plot x- & y-intercept (a 3rd point if you wish to be safer!) for the **boundary line** and then show your "Test Point" on the graph and the work for your "Test" in your problem, and shade properly.) **Remember** to use a **"dotted** boundary line" for **<** or **>** and a **solid** boundary line if the inequality is "or equal to."
7.4/374	1,5,9	**Distance Between Two Points:** In words: to find the distance between two points, do the following: Take the difference of the "x-values" and then square, do the same thing for the difference in the "y-values" then square. Add these two numbers together, then take the square root of the result. The formula is on page 366.
7.4/374	19,25,27	**Slope Between Two Points:** In words, this is Rise over Run. Given two points, take the difference in the "y-values" and divide by the difference in the "x-values", being careful to keep the same order (2nd minus 1st) on both top and bottom. The formula is on page 369. **Note:** Also be **able to identify slope** of a line by looking at its **graph** as we did on **PT #7, problem #22.**
7.5/386	3,11,19,35,39	**Writing Equations of Straight Lines:** (Be able to put into both Standard Form & Slope - Intercept Form, depending on which is requested. Use our **WS#22** Answers to 7.5 in y=mx+b form to practice that**.**
PT#7	#16 - #19	**Be able to match the graph of a horizontal or vertical line to its equation and to identify its slope as on PT #7.**
11.1/602	1,3,13,21,23,33,35	**Systems of Linear Equations** (You will need to know **BOTH** the Substitution and the Elimination by Addition Methods) Remember to give your answer as an ordered pair with the x value first and the y-value 2nd.