

MATH 2 MIDTERM STUDY GUIDE

The purpose of this guide is to ASSIST you in studying for the midterm. Do not expect this guide to teach you everything you need to know for the exam. We expect you to review the material in the textbook and do exercises to solidify your understanding. This is just to highlight some trouble spots, give hints on important concepts, and give some direction to your studying.

Basic Concepts:

Know the order of operations. Parentheses first! Then what? p.25.
Remember the distributive property! Check out p.34, Example 8.

Chapter Two:

When solving linear equations and inequalities, get rid of any fractions by multiplying by the LCD and decimals by multiplying by multiples of 10. *Sections 2.1 and 2.4.*

When do you use brackets in interval notation? Parentheses? What about for ∞ or $-\infty$? p.76.

Inequalities change direction *only* when multiplying or dividing by a negative number. p.78.

Know how to solve compound inequalities. What does *and* and *or* mean? Which corresponds to union? Intersection? Can you graph it on a number line? What type of inequalities give you open and closed points? *Section 2.5.*

How do you solve $|x| = |y|$? *Section 2.6.*

What is the difference between $|x| < a$ and $|x| > a$? How do you graph them?
When writing the solution set, make sure to use \cup when necessary. *Section 2.7.*

Chapter Three:

Know how to graph lines and absolute value functions by plotting points and checking x - and y - intercepts. *Sections 3.1 and 3.3.*

Know how to find the domain and range of a relation. What makes a relation a function? *Section 3.2.*

Know the three forms for linear equations. If you only remember one, make it *slope-intercept* form. *Section 3.5.*

Know how to find the equation of a line if given: two points; a point and a line parallel to it; a point and a line perpendicular to it; a point and the slope; or the graph of the line. *Section 3.5.*

Know how to graph linear inequalities. When is the line dotted and when is it solid? Remember to test a point off the line to see where to shade. See *Section 3.6* for pictures.

Chapter Four:

Know how to solve a system of linear equations using the substitution method, the elimination by addition method, or Cramer's Rule. If you only learn one, make it *substitution*, but to avoid fractions, use elimination. *Section 4.1.*

As in solving linear equations from Chapter 2, get rid of fractions and decimals *first*. pp.196-7.

If the solution of a system of equations gives specific values for x and y (and z), then be sure to write it as an ordered pair (triplet). *Sections 4.1, 4.2.*

What does it mean if the variables disappear and you have a true statement (such as $0 = 0$)? What about if it is false (such as $0 = 23$)? Is the system of equations inconsistent? Dependent? What are the solution sets? Which one gives \emptyset ? Be sure to use set notation (e.g. $\{(x, y) | -5x - 3y = 9\}$) when necessary. *Sections 4.1-4.3, 4.5.*

You do not have to learn Section 4.4, as it was not covered in lecture.

Chapter Five:

Remember the rules for exponents. They are listed on p.254. Look over Examples 3 and 4 on pp.254-5 carefully, especially 4b. *Sections 5.1 and 5.2.*

Have an idea of how scientific notation works. Remember the number a in $a \times 10^r$ is $1 \leq a < 10$. *Sections 5.1 and 5.2.*

Know what a polynomial is (e.g. $4x^5y + 7xz$) and how to simplify a polynomial (i.e. *combine like terms*). *Section 5.3.*

Know how to multiply polynomials through the distributive property. You can use FOIL for multiplying two binomials. *Section 5.4.*

Note $(a + b)^2 \neq a^2 + b^2$ and $(a - b)^2 \neq a^2 - b^2$. What *do* they equal? pp.271-2. *Know how to factor polynomials (Sections 5.5 through 5.7):*

Always look for the greatest common factor (GCF) *first*. (5.5)

If you have four terms, see if you can factor by grouping. Be careful of sign changes when grouping with subtraction. For example,

$$x^3 - x^2 - 2x + 2 = (x^3 - x^2) - (2x - 2). \quad (5.5)$$

Know the process for factoring trinomials of the form $ax^2 + bx + c$: If $a = 1$, try to find two numbers whose product is c and whose sum is b . For any a , you can use the ac -method from class (factoring a trinomial by grouping on p.287) To check, FOIL your answer to get the original trinomial. (5.6)

Be able to *recognize* and *apply* the special forms for factoring: difference of squares; perfect square trinomials; the sum and difference of cubes. (5.7)

Note that $1 = 1^2 = 1^3$.

Be able to solve equations by factoring. Remember that if $a \cdot b = 0$, then $a = 0$ or $b = 0$ will make the statement true. p.298.

If you factor out an x , it is still a solution, namely, $x = 0$, as in Example 6 on p.300. *Section 5.8.*

Be careful of any tricks (e.g. Factor $54y^3 - 128$. What do you do first?)

Be confident in your answers, but still *always* double check them. Best of luck to you!