

ALGEBRA

Notes on Chapter Five

These helpful comments do not in any way replace your own work and study (and these aren't the notes that you can turn in for extra credit—see the guidebook for information on how to correctly make those notes). These are just a few hints that can help you avoid a few of the common mistakes that students tend to make in chapter 5.

SECTIONS 1, 2, and 3:

I have made a handout that deals with almost all the ways you use exponents (which is most of sections 1, 2, and 3). To find the handout, go to the Algebra Course Info webpage (which is linked from the main page of the Math Department website), and look at the November row in the chart at the bottom of the webpage. The line you're looking for is: "**Handout:** Exponents (5-1, 5-2, 5-3)"

SECTION 4:

Scientific notation requires that one number, and only one number, be to the left of the decimal point. Therefore, if you multiply or divide and end up with something like 32×10^8 , you are not finished. That is not a correct answer. You must move the decimal to the left and correspondingly increase the exponent. So, the correct answer would really be 3.2×10^9 . Although this seems picky, that's the way math is: precise, exact, specific. It's simply right or wrong, so make sure you carefully follow rules like this exactly as they are.

SECTION 8:

When you have: $-(3x^2 + 5x - 4)$, the negative outside the parentheses changes the sign of every term inside the parentheses. Therefore, $-(3x^2 + 5x - 4) = -3x^2 - 5x + 4$. One way to think of this is to remember that the negative/minus sign really means there's a -1 there. So $-(3x^2 + 5x - 4)$ is really the same as $-1(3x^2 + 5x - 4)$. When you use the distributive property (multiply the negative one to each term inside the parentheses) you get: $3x^2 \cdot -1 + 5x \cdot -1 - 4 \cdot -1$ which becomes $-3x^2 - 5x + 4$. That's the mathematical reasoning behind changing all the signs. **WARNING:** Forgetting to change every sign inside the parentheses is a very common mistake. Now that you know about it, don't forget it!

SECTION 9:

The FOIL method is a good one for multiplying binomials. However, you're better off if you remember the basic concept of taking the first term and multiplying it to every term in the second binomial, then taking the second term and multiplying it to every term in the second binomial. You can use that method to multiply polynomials no matter how many terms they have. So, $(6x - 2)(3x^2 + 7x - 4) = 6x(3x^2 + 7x - 4) - 2(3x^2 + 7x - 4)$

SECTION 10:

Don't make this common squaring mistake:

- **INCORRECT:** $(3x + 5)^2 = 9x^2 + 25$ Don't do that! Remember that an exponent means that you multiply the base to itself, that many times.
- **CORRECT:** $(3x + 5)^2 = (3x + 5)(3x + 5) = 9x^2 + 15x + 15x + 25 = 9x^2 + 30x + 25$

SECTION 11: See the paragraph for section 9.