## Topics to be explained to students in Math-130, 3/25/2014, room M2-0214, 12:30pm – 1:45 pm

Prof. Kovitz: will use his judgment and cover any or all of these topics. There will be a quiz in the last 25 minutes of class.

## AGENDA for this class:

- 1. Take attendance by passing around the form provided. (OK if they are late).
- 2. Review: what is a function (vertical line test): students should know this.
- 3. Review: function with domain not specified. Find maximal domain. Examples: f(x) = 1/(x+2).  $g(x) = \sqrt{(x+5)}$ .  $h(x) = (x^2-1)/(x-1)$
- 4. Define: EVEN and ODD functions.

Even function: f(x) = f(-x) [the "-" sign makes no difference!] Odd function: f(-x) = -f(x) [the "-" sign can come out of the function] Examples. Even functions (polynomials with only even-degree terms) Examples. Odd functions (polynomials with only odd-degree terms) If it isn't a polynomial, be careful!

Prof. Kovitz may give some examples as he thinks proper.

- 5. The concept of a "parent function".
  - a. Examples: (a)  $y = x^2$ ; (b) y = |x|
- 6. Function shifting:
  - a. Recall: Circle  $x^2 + y^2 = r^2$ . Shift to (h,k) as  $(x-h)^2 + (y-k)^2 = r^2$
  - b. Recall: Vertex form of the parabola:  $y = ax^2$ . Shift to (h,k) as:  $(y-k) = a (x-h)^2$ . Prof. Kovitz teaches this as:  $y = a (x-h)^2 + k$ . Please understand both methods.
  - c. General function y = f(x). Shift "origin" to (h,k) as: (y-k) = f(x-h). Prof. Kovitz teaches this as: y = f(x-h) + k. Please understand both methods.
  - d. Prof. Kovitz may give some examples as he thinks proper.
- 7. Function mirroring:
  - a. g(x) = f(x) mirrored about x axis: g(x) = -f(x)
  - b. h(x) = f(x) mirrored about y axis: h(x) = f(-x)
- 8. Compare even/odd functions with mirroring:
  - a. Even function is its own mirror about the y axis.
  - Odd function is itself, if you FIRST mirror about x axis, and THEN mirror about y axis.
    ( or vice versa);
    - Another way: do a 180-degree rotation about the origin.
  - c. Prof. Kovitz may give some examples as he thinks proper.
- 9. If there is time, Prof. Kovitz may present examples of compound operations:
  - Shift, then mirror, ...
- 10. Give quiz.