1. This list is not in final form. Like, stuff may yet be added to it.

2. Test #1 is

   Wednesday
   9/21/05

3. There will be a with-calculator part of this exam. So have some batteries in your calculator. And bring it to the test.

4. The test will cover the material of Assignments #1 – #15 roughly.

5. Be sure you can

   (a) Add algebraic fractions using the Least Common Denominator

   (b) Derive the Quadratic Formula and be able to discuss the Discriminant.

   (c) Make a sign-change chart for a product of binomials.

   (d) That you know the two big triangle theorems:
      
      (i) Pythagoras’s Theorem
      
      (ii) The Similar-Triangles Theorem

   These both relate picture information to algebra.

   These theorems lie at the base of all the straight-line-equations facts: slope works because of the Similar-Triangles Theorem; the perpendicularity-and-slope criterion works because of Pythagoras.

   The equation of a circle comes straight from the distance formula, which, in turn, is a manifestation of Pythagoras’s Theorem.

   (e) Completing the Square lies at the heart of
       
       (i) deriving the quadratic formula
       
       (ii) parsing a quadratic-in-\(a\)-and-\(y\) equation to see whether it’s a circle.

   (f) Add algebraic fractions using the Least Common Denominator

   (g) Decode negative exponents in expressions.

   (h) Decode fractional exponents in expressions.
(i) 

(j) 

6 Re the absolute-value inequalities on assignment #14:

(a) \( |x + 1| \geq 3 \).

For this one, many folks offered this beginning ploy:

\[-3 \geq x + 1 \geq 3,\]

which excites suspicion because it implies that \(-3 \geq 3\). So, don’t do that!

Method A

One can correctly say that this inequality means that \((x + 1)\) lies at least 3 units from zero, so

(i) \( x + 1 \geq 3 \) or \( x \geq 2 \), OR

(ii) \( x + 1 \leq -3 \) or \( x \leq -4 \).

We can put these two solutions together into the BOB answer: \((-\infty, -4] \cup [2, +\infty)\).

Method B

Here’s the trick presented in class: trade the given inequality in, temporarily, on the complementary inequality:

\[ |x + 1| < 3. \]

This complementary inequality says that the distance from \((x + 1)\) to 0 is less than 3, so

\[-3 < (x + 1) < 3.\]

We can add \(-1\) to all three sides of this last inequality to get

\[-4 < x < 2,\]

which means that the complementary inequality’s solution is \((-4, 2)\).

This means that the original inequality, \(|x + 1| \geq 3\), has solution set

\((-\infty, -4] \cup [2, +\infty)\)

(b) The second problem’s solution: \( \left( -\frac{4}{5}, \frac{8}{5} \right) \).
(c) The third problem’s solution: \((-\infty, -3] \cup [-1, \infty)\).

This arises from using algebra on the given inequality to change it to \(|2x + 4| \geq 2\).

7 The purple-page end-of-chapter-1 Test on page 132++ has all the BOB answers. All of the problems are fair game **EXCEPT**

(i) 3, 9

(ii) 19, 20, 21 (guaranteed to be on test #2)