Turn in starred problems, and only starred problems, Wednesday 09/19/2012.

Multiple-page homework must be STAPLED when handed in.

Section 4.3:

- 1 (a), (b), (c), *(g), *(l)
- 2
- 6 (a), *(e), *(p), *(t)

Hints and remarks: 1. In problem 1(l) you should use the factorization $x^4 - 1 = (x-1)(x+1)(x^2+1)^2$. The equation has singular points at $x = \pm i$ in the complex plane, but you can ignore these; we are interested only in *real* singular points.

2. Problem 6(e) is very simple: it is an *Euler*, or *Cauchy-Euler*, or *equidimensional*, equation. I mentioned this type of equation in class on Monday 9/10; you can also read about it in Section 3.6.1. **You don't need to introduce a series to solve the equation; see class notes or Section 3.6.1.** (However, if you are so inclined it may be instructional to do so and see what happens.)

3. For problem 6(p) you will not be able to find the general recursion relation, due to the difficulty in carrying out the multiplication of series involved in the term $e^x y'$. Instead, just work with a few terms of the series, without using sigma notation. Find four non-zero terms of each of the two solutions, that is, if the solution is $y(x) = x^r(a_0 + a_1 x + a_2 x^2 + a_3 x^3 + \cdots)$ find a_1, a_2, and a_3 in terms of a_0.

4. Problem 6(t) may look a bit confusing as written, but just simplify: $(xy)'' = xy'' + 2xy'$.