Math 262a — Topics in Combinatorics — Fall 1999 — Glenn Tesler
Homework 1 — October 6, 1999

1. Putting things into hypergeometric series notation: Koepf # 2.11(b,f), 2.9(d). (Warning: 2.9(d) is tedious.)

2. Differential/difference equations for hypergeometric series: Koepf # 2.3–2.5.

3. Apply Koepf # 2.3 to find differential equations satisfied by

$$e^x = {}_0F_0 \left[\begin{matrix} - \\ - \end{matrix} ; x \right] \qquad\qquad \sin x = x \, {}_0F_1 \left[\begin{matrix} - \\ 3/2 \end{matrix} ; -\frac{x^2}{4} \right]$$

Simplify them as much as possible. (e^x is easy, $\sin x$ is tedious.)

4. q-analogues: Koepf # 2.21, 3.15(b).

There is also software installed on euclid that can do some of these problems. See the class homepage
$$\texttt{http://math.ucsd.edu/}\sim\texttt{gptesler/math262}$$
for more info. In your euclid account, type

    cd ∼gptesler/homepage/math262/KOEPF/worksheetsV.4
    xmaple &

and then open a worksheet from "Open" in the "File" menu. The examples within the text are in worksheets `chap1.mws` — `chap13.mws`, while the exercises are in `exer2.mws` — `exer13.mws`. These are from Koepf's web site. The problem numbers are generally not marked within the worksheet.