Challenge Exercise 2
MATH 1271/3071 – 2012
Due Date: Nov. 23, 2012

These challenge exercises ask you questions about material covered in class, but at a greater depth. You are not required to do this exercise; it is intended as extra work. However, you will receive extra credit if you complete the problem correctly.

When handing this assignment in, please clearly label your work as a Challenge Exercise. Make sure to include your name.

Problem 1. **[7pts]** Suppose that we consider the the "left justified" Pascal Triangle, i.e.,

$$
\begin{array}{ccccccc}
1 & & & & & & \\
1 & 1 & & & & & \\
1 & 2 & 1 & & & & \\
1 & 3 & \underline{3} & 1 & & & \\
1 & \underline{4} & 6 & 4 & 1 & & \\
\underline{1} & 5 & 10 & 10 & 5 & 1 & \\
1 & 6 & 15 & 20 & 15 & 6 & 1 \\
 & \vdots & & & & &
\end{array}
$$

As in class, we start our counting of the rows from 0 instead of 1. Starting from any row, add the numbers you get by moving one up and one to the right. For example, if we start at row 5, the underlined numbers in the above triangle sum to $1 + 4 + 3 = 8$.

Use this procedure to compute some addition "diagonal" sums. What is the pattern? (Note that the first three sums are: $1 = 1$, $1 = 1$, and $1 + 1 = 2$.) Now come up of a proof that your pattern holds for all rows.

Problem 2. **[3pts]** Find 6 typos/errors in the textbook. Tell me which page and line they are on, and what the correction should be. I will compile all the corrections and send them to the author to help improve the textbook.