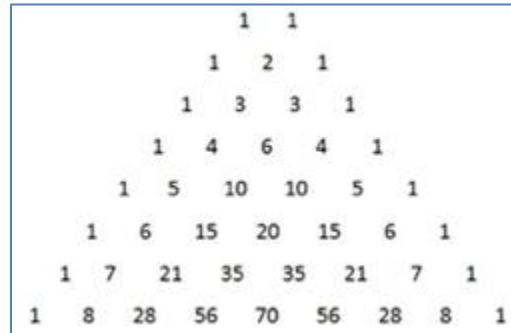


HW #9: PASCAL'S TRIANGLE – due Mon. 5/1/17

Write all work and answers on a separate sheet of paper. Make sure your work is legible, and make it clear how you got your answers.

In the diagram below, the first eight rows of Pascal's Triangle are shown.



1. For each of the first five rows of the triangle, find the sum of all of the entries in each row.
 - a) Look at your results. What pattern do you notice?
 - b) Check to see whether that pattern continues for the next few rows. Do you think it will always work?

For #2 below, use this definition:

For any ordered list of numbers, the “*alternating sum*” of that list is found by starting with the first number, then subtracting the second number, then adding the third, and so on, alternately subtracting and then adding until you run out of numbers in the list. For example, the “*alternating sum*” of the fourth row of Pascal's triangle (see above) would be: $1 - 4 + 6 - 4 + 1$, which is equal to 0.

2. For each of the first five rows of the triangle, find the “*alternating sum*” of the entries in that row.
 - a) Look at your results. What pattern do you notice?
 - b) Check to see whether that pattern continues for the next few rows. Do you think it will always work?
3. Can you find any other similar patterns within the triangle? (This is an open-ended question. There are lots of unexpected patterns that occur in various ways in Pascal's Triangle; I'm just curious to see what you come up with without being prompted.)