The University of Portland
Donald P. Shiley School of Engineering

EGR361
Analysis of Engineering Data

HOMEWORK 1—Finding Probabilities Using Pascal's Triangle

<u>**Assigned:**</u>   Wednesday, January 18, 2017
<u>**Due:**</u>   Wednesday, January 25, 2017

<u>**Problems:**</u>

Solve each problem using only the numbers in Pascal's triangle. Provide a Pascal triangle for each problem and box the numbers you are using in Pascal's triangle for your solution. Also, box the answer(s) for each problem.

1) Find the number of possible outcomes if one tosses a fair coin:

a) 3 times
b) 6 times
c) 9 times

2) Determine how many different ways one can choose five balls out of 15 balls numbered from 1 to 15. (Ignore the order of the balls selected, that is for example, 12, 5, 3, 9, 1, or 9, 12, 1, 3, 5, or any other combination of these five numbers count only once.)

3) Blaise tosses a fair coin eight times.

a) How many different ways could five of the eight outcomes be tails?
b) What is the probability that three of the eight outcomes are tails?
c) What is the probability that three of the eight outcomes are heads?

4) Find the probability that all outcomes are the same when Pierre tosses a fair coin

a) 4 times
b) 6 times

5) If a family has seven children:

a) What is the probability that the number of boys and girls in this family differ by one?
b) What is the probability that at least three of the children are girls?
c) What is the probability that at most three of the children are girls?

<u>**Resources for further reading:**</u>

http://www.mathsisfun.com/pascals-triangle.html

http://www.maths.surrey.ac.uk/explore/amandhispages/quizpage_7a.html