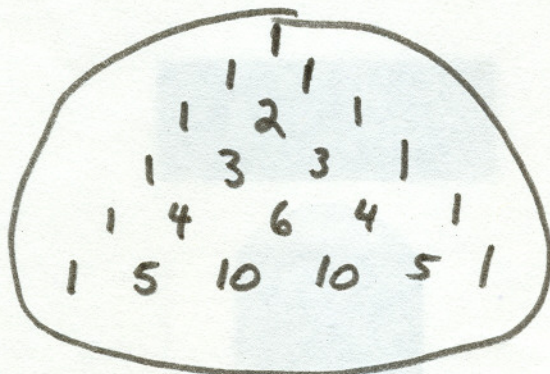


# Math 574 Exam 2 1987

There are 10 problems (each worth 10 points) on 6 pages.  
Explain your work. Circle your answer when possible. Write  
 your answer as a number when possible.

- ① List the first 6 rows of Pascal's triangle. (Go as far as 1 5...)



- ② A care package is a bag containing 12 cans of soup. If four flavors of soup are available, how many types of care packages can be created?

I identify each type of care package with a word made from 12 p's 3 d's.  
 (For example if the soups are Vegetable, Tomato, Onion and Chicken, then  
 PPPΔΔPPPΔPPPPPP means 3V, 2OT, 3O, 6C)

There are  $\binom{15}{3} = \frac{15 \cdot 14 \cdot 13}{2 \cdot 2} = \boxed{455}$  such words.

- ③ If a fair coin is flipped 6 times, what is the probability of getting an even number of heads and a head on the first toss?

Let the sample space be all words of length 6 made from T and H. There are  $2^6$  such words. A successful event has H first and 1 or 3 or 5 of the remaining 5 letters are H. There are  $\binom{5}{1} + \binom{5}{3} + \binom{5}{5} = 5 + 10 + 1 = 16$  such words

$$\text{ans} = \frac{16}{64} = \boxed{\frac{1}{4}}$$