

**Math 574, 1992, Exam 2**

There are 6 problems. The exam is worth a total of 100 points. SHOW your work.

**CIRCLE** your answer.

1. (17 points) If a coin is flipped 8 times, then what is the probability that the coin lands on heads exactly 4 times?
2. (17 points) Eight friends decide to have their picture taken. How many ways are there to arrange all eight people in a straight line, if John insists on being next to Mary?
3. (17 points) A multiple choice test consists of 10 questions. There are 3 choices for each of the first 4 questions and 4 choices for each of the last 6 questions. Each question has exactly one correct answer. If a student chooses answers at random, then what is the probability that the student will guess a perfect paper?
4. (17 points) The faculty senate consists of 15 scientists and 9 historians. The steering committee always consists of 5 scientists and 4 historians. How many different possible steering committees are there?
5. (16 points) A certain candy store has 4 flavors of candy: chocolate, vanilla, strawberry, and orange. The store sells its candy by the bag. Each bag contains 12 pieces of candy. How many types of bags of candy can the store sell? (NOTE: Two bags of candy are considered to be the same type if they contain the same number of chocolate pieces, the same number of vanilla pieces, the same number of strawberry pieces, and the same number of orange pieces.)
6. (16 points) How many ways are there to seat 3 men and 8 women in a row if none of the men are seated next to each other?