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?

$\binom{15}{5}\binom{9}{4}$

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.)

12 Picks 3 switches: $\binom{15}{3}$

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?

There are $\binom{8}{3}$ ways to arrange MW, MW, MW, W, W, W, W, W (These arrangements end in W)

There are $\binom{8}{2}$ ways to arrange MW, MW, W, W, W, W, W, W (These correspond to MW|M)

Thus there are $\binom{8}{2}+\binom{8}{3}=\binom{9}{3}=84$ words consisting of 3 M's & 8 W's with no adjacent M's.

Each word gives rise to $(3!)(8!)$ arrangements of people.

$(84)(3!)(8!)$