8. I found a long list of problems suitable for a 574 final exam. Twenty of the problems involve counting and 30 of the problems involve graph theory. How many possible exams can I create if I choose 11 counting problems from the list and 9 graph theory problems from the list? (Note: two exams are considered to be the same if they have the same questions. The order of the questions does not matter.)

\[(20) \cdot (30)\]

9. City council consists of 11 people. Each person from council will serve on exactly one committee. The Zoning Committee will have 4 members, the garbage committee will have 3 members, the cable TV committee will have 2 members, and the water committee will have two members. How many ways are there to make committee assignments?

\[\binom{11}{4,3,2,2} = 69,300\]

10. What is the coefficient of \(x^2y\) in \((1+2x+3y)^7\)?

\[(1+2x+3y)^7 = (4\binom{7}{2}1)(1^1)(2x)^2(3y)^5 + \ldots \]

The set of \(x^2y\) is \(\binom{7}{4,2,1}\) \(4,3\)