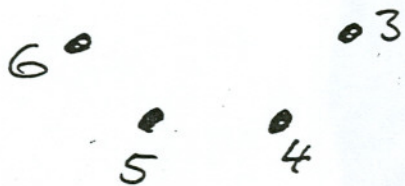


8) I found a long list of problems suitable for a 574 Final Exam. Twenty of the problems involve counting and 30 of the problems involve graph theory. How many possible exams can I create if I choose 11 counting problems from the list and 9 graph theory problems from the list? (Note: two exams are considered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

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?

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

11) Let $\begin{matrix} 1 & 2 \\ \bullet & \bullet \\ 6 & 3 \\ \bullet & \bullet \\ 5 & 4 \end{matrix}$ be labeled vertices in a tree.



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Draw all trees which have degree 4 at vertex 3, degree at vertex 6 and degree 1 elsewhere.

12) Solve the recurrence relation $a_n = 4a_{n-1} - 4a_{n-2}$

$a_0 = 2$ and $a_1 = 10$.