Homework 1

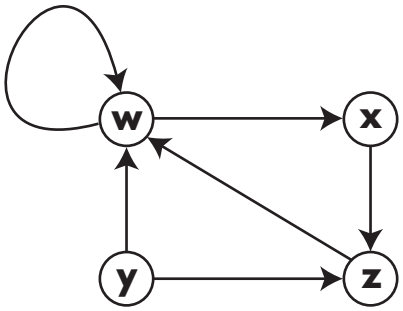
Combinatorics, Dave Bayer, due January 28, 2014

Name: _____ **Uni:** _____

[1]	[2]	[3]	[4]	**Total**

If you need more that one page for a problem, clearly indicate on each page where to look next for your work.

[1] Without using matrix multiplication, count the number of paths of length ten from w to itself.



[2] Let x and y have degree 1, and let z have degree 3. Count the number of monomials in x, y, and z of degree 12.

[3] Six people are seated around a round table.
(a) How many ways can they be reseated, so everyone moves to a new chair?
(b) How many ways can they be reseated, so everyone has new neighbors on both sides?

[4] There are five ways to fully parenthesize the product $abcd$:

$$a(b(cd)) \qquad a((bc)d) \qquad (ab)(cd) \qquad (a(bc))d \qquad ((ab)c)d$$

How many ways are there to fully parenthesize the product $abcdef$?