Name __________________________________ **SSN** ____________________

CMSC 203 - Homework Assignment 4 - Due November 14, 2002

1. Show *algebraically* that C(25,12) = C(24,12) + C(24,11)

Name ______________________________ **SSN** ____________________

CMSC 203 - Homework Assignment 4 - Due November 14, 2002

2. Show that the sequence $\{a_n\}$ generated by $a_n = 5n + 3$ satisfies the recurrence relation:

$$a_n = 2a_{n-1} - a_{n-2}.$$

Name ___________________________________   SSN ____________________

CMSC 203 - Homework Assignment 4 - Due November 14, 2002

3. Find the general solution for the linear, homogeneous recurrence relation:

$$a_n = 12a_{n-1} - 36a_{n-2} \text{ for n > 1.}$$

Name ________________________________ SSN __________________

CMSC 203 - Homework Assignment 4 - Due November 14, 2002

4. Find the Particular Solution for the linear, homogeneous recurrence relation whose general solution is:

$$a_n = 3(2^n) - 2(5^n)$$

subject to the initial conditions $a_0 = 1$ and $a_1 = -4$.

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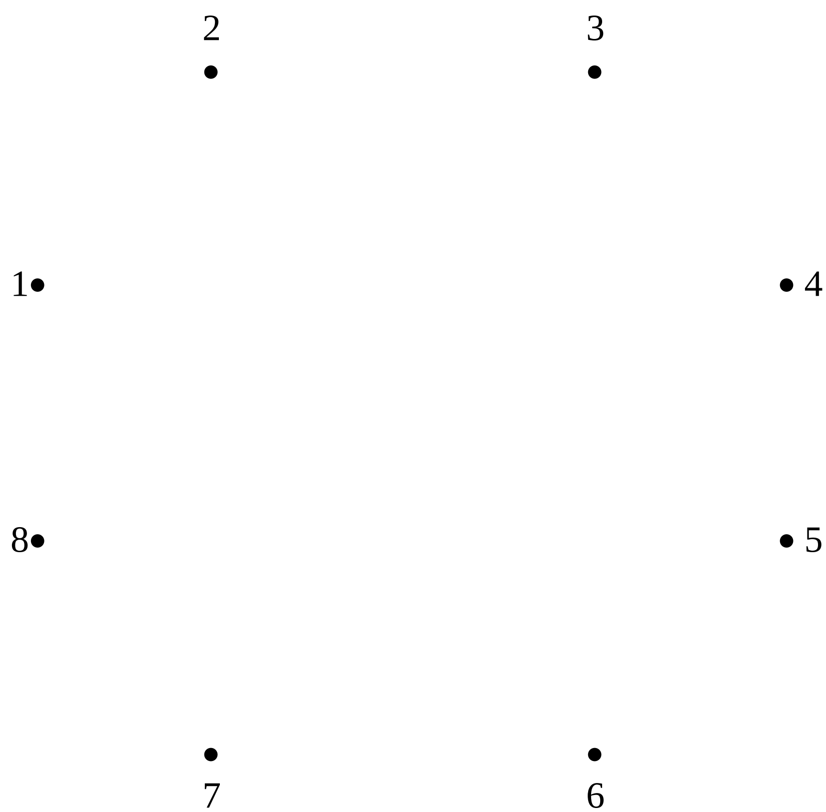
Name ____ **SSN ______________________**

CMSC 203 - Homework Assignment 4 - Due November 14, 2002

5. Draw the directed graph of the relation R on A = {1,2,3,4,5,6,7,8} defined as

R = $\{(a,b) \mid a,b \in$ A and $a \equiv b$ mod 3$\}$.



Name ________________________________ **SSN** __________________

CMSC 203 - Homework Assignment 4 - Due November 14, 2002

6. Let F be a function on the integers.
(a) Show that the relation R = $\{(x,y) \mid x,y$ are integers and $F(x) = F(y)\}$is a Reflexive, Symmetric, and Transitive relation.

(b) Describe the partition of the integers induced by R.