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College of Informatics and Computing Sciences

Discrete Mathematics 2nd quiz

1. Mathematica Induction.

   a. $1^3 + 2^3 + 3^3 \ldots n^3 = \dfrac{n^2(n + 1)^2}{4}$

   b. $1 + 3 + 6 + 10 + \ldots + \dfrac{n(n + 1)}{2} = \dfrac{n(n + 1)(n + 2)}{6}$

2. Given recurrence relation $a_n = a_{n-1} + 2a_{n-2}$ for $n \geq 2$ where $a_0 = 2$ and $a_1 = 5$. Find a_2, a_3, a_4 and a_5.

3. If $a_0 = -7$, find the a_1, a_2, and a_3 where $a_n = a_{n-1} + 6$

4. Solve the recurrence relation $a_n = 5a_{n-1}$, where $n \geq 1$ and $a_2 = 175$

5. Emily is choosing a password for access to the Internet. She decides not to use the digit 0 or the letters A, E, I, O, or U. Each letter or number may be used more than once. How many passwords of 3 letters followed by 2 digits are possible?

6. Find the number of ways to listen to 6 different CD's from a selection of 18 CD's.

7. How many ways are there to give 4 honorable mention awards to a group of 10 students?