MATH 280 Discrete Mathematical Structures Assignment #2   Name _____

The point values for each question is given within []. The total number of points for this assignment is 36.

Most of these problems have a single number for an answer. For full credit (or partial credit if your answer is incorrect), show how you obtained your result.

[2]   1. How many three-digit numbers less than 600 can be made using the digits 2, 4, 6, and 8? For example, 262 is one such number.

[4]   2. Each of the following questions assume a letter may not be used more than once within the same string.

    (a) How many different ways can four of the letters of the string *ALGORITHM* be selected to form a new string?

    (b) How many different ways can four of the letters of the string *ALGORITHM* be selected to form a new string if the first letter in the new string must be *T*?

[6]   3. A bit string is a finite sequence of 0s and 1s.

    (a) How many different bit strings have length 9?

    (b) How many different bit strings of length 9 begin with three 0s?

    (c) How many different bit strings of length 9 contain three 0s?

[4]   4. Of 150 programmers at a convention for software developers, 97 know C#, 83 know Java, 28 know Python, 53 know both C# and Java, 14 know both Java and Python, 7 know both C# and Python, and 2 know C#, Java, and Python.

    (a) How many programmers at the conference know only C#?

    (b) How many programmers at the conference know none of the three languages?

[4]   5. Compute the following.

    (a) $P(8,5)$

    (b) $P(n,n-1)$

    (c) $\binom{8}{6}$

    (d) $\binom{n}{n-1}$

[6]   6. A coin is tossed four times. Each coin toss results in "heads" or "tails." The coin is fair, so "heads" and "tails" are equally likely.

    (a) How many different outcomes are possible for the four tosses?

    (b) What is the probablity that exactly two "tails" occur?

    (c) What is the probablity that exactly one "heads" occurs?

[6]   7. Ten distinct points labeled A, B, C, D, E, F, G, H, I, and J are located on a plane.

    (a) How many line segments are possible using any of the ten points as endpoints?

    (b) How many line segments are possible if point A is *not* used?

    (c) How triangles have three of the ten points as vertices?

[2]   8. A soccer team has 18 players on its roster, and 11 players make up a team for a match. In how many ways can a team be chosen?

[2]   9. In how many ways can the Computer Club president, vice-president, and secretary be selected from a pool of 85 Computing majors?