

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.
- How many different ways can four of the letters of the string *ALGORITHM* be selected to form a new string?
 - 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.
- How many different bit strings have length 9?
 - How many different bit strings of length 9 begin with three 0s?
 - 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.
- How many programmers at the conference know only C#?
 - How many programmers at the conference know none of the three languages?
- [4] 5. Compute the following.
- $P(8, 5)$
 - $P(n, n - 1)$
 - $\binom{8}{6}$
 - $\binom{n}{n - 1}$
- [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.
- How many different outcomes are possible for the four tosses?
 - What is the probability that exactly two “tails” occur?
 - What is the probability 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.
- How many line segments are possible using any of the ten points as endpoints?
 - How many line segments are possible if point *A* is *not* used?
 - How many triangles have three of the ten points as vertices?
- [2] 8. A soccer club has 18 players on its roster, and 11 players make up a team for a match. In how many ways can the starting team for a match be chosen?
- [2] 9. In how many ways can the Computer Club president, vice-president, and secretary be selected from a pool of 101 Computing majors?