Name: _____

MATH 307
Spring 2023
HW 3: Due 02/15 (16)

"For the things we have to learn before we can do them, we learn by doing them."

–Aristotle

Problem 1. (10pt) A box of candy contains 30 different pieces of candy. Of these pieces, 10 are filled with chocolate, 10 are filled with nougat, and 6 are filled with both.

(a) How many ways can you select a candy that contains chocolate or nougat?

(b) How many pieces of candy contain neither chocolate nor nougat?

(c) How many ways can you select a candy that is filled with chocolate or something other than chocolate or nougat?

Problem 2. (10pt) A restaurant has a breakfast special. The special consists of a selection of a sandwich, a side, and some beverage. The restaurant offers 5 different breakfast sandwiches, 8 different sides, and 3 different beverages. You must choose two different sides. How many possible breakfast orders are there?

Problem 3. (10pt) Showing all necessary work, compute the following:

(a) $8!$

(b) $0!$

(c) ${}_9P_2$

(d) $\binom{6}{4}$

(e) ${}_{15}C_3$

Problem 4. (10pt) There are 19 students in a homeroom. Of these students, 8 are in choir, 5 are in orchestra, and 1 is in both. A student claims that there are $8+1=9$ students in choir and that there are a total of 5 students that are in neither orchestra nor choir. Is the student correct? Explain.