

Name: _____

Directions: Show all work. No credit for answers without work. Unless specifically asked for a numerical answer, you may leave your answers in terms of exponentials, factorials, permutation numbers, and binomial coefficients.

1. [4 points] Determine the number of non-negative integral solutions to the following.

(a) $x_1 + x_2 + x_3 + x_4 + x_5 + x_6 = 80$, with $x_3 \geq 8$.

(b) $x_1 + x_2 + x_3 + x_4 + x_5 + x_6 = 80$, with $x_3 \geq 8$ and $x_5 \leq 50$.

2. [3 points] A company wishes to order s sandwiches for their annual party from a menu that lists k types of sandwich. How many ways are there for the company to complete its order?

3. [3 points] Find $\mathcal{P}(\{1, 2, 3\})$.