

Name: _____

Directions: Show all work.

1. [2.5 points] How many ways are there to make a list (x_1, \dots, x_5) where each x_i is a digit in $\{0, \dots, 9\}$ and we have 4 even digits and one odd digit? For example, $(0, 0, 1, 8, 6)$ and $(2, 2, 4, 6, 3)$ count but $(0, 1, 2, 3, 4)$ and $(0, 0, 0, 0, 0)$ do not.

2. [2.5 points] How many integers in $\{1, \dots, 1000\}$ have no repeated consecutive digits?

3. **[2.5 points]** Count the functions $f: \{1, \dots, 9\} \rightarrow \{1, 2, 3, 4\}$ such that $f(1) = f(t)$ for some $t \in \{2, \dots, 9\}$.

4. **[2.5 points]** How many integers in $\{1000, \dots, 5000\}$ are even and have all distinct digits?