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 factorials.

1. **[3 points]** Evaluate \( P(7, 3) \) numerically.

\[
P(7, 3) = 7 \cdot 6 \cdot 5 = 210
\]

2. **[3 points]** A bag of marbles contains 3 red marbles, 4 blue marbles, 1 yellow marble, and 6 green marbles. One by one, a marble is removed from the bag, its color is recorded on a list, and the marble is discarded; the process repeats until the bag is empty. How many lists of colors are possible?

\[
\text{Arrange } \text{RRRBBBYYGGGGGG} : \\
\frac{(14)!}{3! \cdot 4! \cdot 1! \cdot 6!}
\]

3. **[4 points]** How many 4-digit ATM pins start or end with a 5? For example, 5289, 3125, and 5555 count, but 1556 does not.

\[
\begin{array}{c|c}
\text{Start or end with 5} & \text{Start and end with numbers that are not 5} \\
\hline
5 & \phantom{1000} \\
\end{array}
\]

\[
\# \text{pins not starting or ending with 5} = 9 \cdot 10 \cdot 10 \cdot 9
\]

\[
\# \text{pins not starting or ending with 5} = 8100
\]

\[
x + 8100 = 10000 \\
x = 1900
\]