Problem Solving Session

Be prepared to discuss the following problems in class on Thursday, **October 24**.

1. A parking lot for compact cars has 12 adjacent spaces, and 8 of them are occupied. A large sport-utility vehicle arrives, needing two adjacent open spaces. What is the probability that it will be able to park? (Generalize this!)

2. How many positive integers are there which, in their decimal representation, have strictly decreasing digits? Explain!

3. Let $x = 0.0102040816326428\ldots$ be the real number in the interval $(0,1)$ whose decimal expansion (after the decimal period) is obtained by concatenating the last two digits of the sequence of powers of 2 (padded by 0 in case there is only one digit). Prove that x is rational.