Math 477, Lecture 9 class work

Name: _____

Net ID: _____

1. Suppose that a computer chooses 2,000,000 random numbers each between 1 and 1,000,000, with each number in that range being equally likely. What is the (approximate) probability that no more than one of the numbers are equal to 1?

2. A company distributes packs of screws to a customer. There are 10 screws in each pack, and each screw has a 1/100 chance of being defective. If at least two screws in a pack are defective, the company needs to send the customer another pack at a cost of $1. Note that if this pack also has too many defective screws, it will have to also be replaced as well.

   (a) What is the expected number of defective screws in a given pack?

   (b) What is the probability that a given pack of screws will need to be replaced?

   (c) What is the probability that a customer will require exactly two replacements?

   (d) What is the expected cost of all replacements to a given customer?

3. If a person throws a die 30 times, what is the probability that they will get exactly 4 ones?

4. If a person throws a die until they get get exactly 4 ones, what is the probability that it takes exactly 30 throws?

5. If a person throws a die until they get get exactly 4 ones, what is the expected number of throws needed?