Geometric Distributions Practice

1) Only 4% of people have Type AB blood.
   a) On Average, how many donors must be checked to first find someone with Type AB blood?

   b) What is the probability that at most five people will have to be checked before first finding someone with Type AB blood?

   c) What is the probability that we won't find a Type AB donor before the tenth person?

   d) What is the probability that out of 10 donors at least one have Type AB blood?

2) Cards with athlete's pictures are prizes in a certain type of cereal. There is a 20% chance that the card has a picture of Tiger Woods on it.
   a) What is the probability that the first box that has Tiger's picture is the third box that you open?

   b) What is the probability that the first box that has Tiger's picture is at most the third box that you open?

   c) How many boxes of cereal can you expect to open before you first find a picture of Tiger?

   d) What is the standard deviation of this distribution?

3) Police estimate that 80% of drivers now wear their seatbelts. The set up a safety roadblock, stopping cars to check for seatbelt use.
   a) How many cars do they expect to stop before finding a driver whose seatbelt is not buckled?

   b) What is the probability that the first unbelted driver is in the 6th car stopped?

   c) What is the probability that the first 10 drivers are all wearing their seatbelts?

   d) If they stop 30 cars during the first hour, find the mean and standard deviation of the number of drivers expected to be wearing seatbelts.

4) Suppose a computer chip manufacturer rejects 2% of chips produced because they fail pre-sale testing.
   a) What is the probability that the fifth chip you test is the first bad one you find?

   b) What is the probability that the first bad chip you find is at most the tenth chip you test?

   c) Find the number of chips that you expect to test before finding the first bad chip.