**MA 207 - Binomial Distribution Group Members: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

In Canada, Internet service providers (ISPs) are required to send a notice to subscribers who are downloading files illegally, asking them to stop. A certain ISP found that 53% of subscribers who were notified did not reoffend. Consider a simple random sample of 183 of these subscribers who received a first notice. Let *X* be the number of reoffenders.

1. Is *X* binomial? If not, what type of distribution is it?
2. Can *X* be usefully approximated by a binomial? Why?
3. Give the parameters, *n* and *p,* for the Binomial distribution that gives the probabilities associated with the *count,* *X,* of reoffenders.
4. Can you use the Normal distribution to approximate the binomial distribution in this case? Why or why not?
5. Find the mean and standard deviation for the count *X* of reoffenders.
6. Use the normal distribution to approximate the probability that at most 82 subscribers in the sample reoffended.
7. Use the normal distribution to approximate the probability that at least 90 subscribers in the sample reoffended.
8. Use the normal distribution to approximate the probability that between 82 and 90 reoffended.
9. Find the probability that exactly 86 users reoffended (you do not need to simplify).
10. Use the normal distribution to approximate your answer to part 9.