Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ AP Statistics Date \_\_\_\_\_\_\_\_\_\_\_\_

 “6.3 Extra Practice - binomial and geometric distributions”

El Gargy’s “happy homemaker” magazine reports that 66% of all pet goat owners greet their goats before greeting their spouse and children when they return home from work at the end of the day. He thinks that’s awesome. Suppose he selects 8 goat owners randomly to check this out. He wants to know what is the probability that 3 people , at most, greet their goats before their spouse and children.

1. Is this a binomial probability or a geometric probability problem?

2. Check all the assumptions that prove it. Make sure you fully describe all assumptions.

3. Define a random variable X and any parameters

4. Answer the question using proper probability notation

5. Translate the answer from question 4 into a written statement.

6. What’s the probability that at least 4 goat owners greet their goats before family?

7. Find mean and translate the answer to a written statement.

El Gargy is into drugs. Specifically the goat vaccination business. He has developed a vaccine that will prevent goats from getting “goatees”. He hates those silly beards and suspects others do too. He is convinced they will pay top dollar for such a cure. But the vets have told him there is a 8% random chance of a side effect called GUI (Goat Udder Inflammation) from his vaccine. He hates goats with big udders even more! El Gargy decides to inoculate many goats anyway. He is interested in the number of vaccinated goats until the first case of GUI is observed.

9. Is this a binomial situation or geometric?

10. Check all the assumptions that prove it. Make sure you fully describe all assumptions.

11. Define a random variable X and any parameters

12. Can you think of a possible scenario that would make the trials NOT independent?

13..What’s the probability that the 1st case of GUI will come on exactly the 4th goat he vaccinates? (use proper probability notation)

14. What’s the probability that the 1st case will come in the 1st 6 vaccinations?

15. Find mean and translate the answer to a written statement.

El Gargy is trying to break into the cereal market. He has developed a new flavor called “chocolli puffs”. This is a combination of chocolate and broccoli – YUM. He has decided that to promote this new cereal he will announce that 1 in 4 boxes of will contain a bloody finger (fake but edible, gummy I believe). El Gargy wants to know what is the probability that someone will get 4 bloody fingers out of 5 boxes.

a) Write and check the necessary assumptions to show that this is a binomial situation

b) Define a random variable for this binomial situation and provide the parameters

c) Answer the question with the formula and with the calculator (show calcspeak)

d) What’s the probability of getting at least 2 bloody fingers in 5 boxes? Show calcspeak

e) Find mean and standard deviation of this distribution and translate the answers to a written sentence