

## Math 3160 Quiz 6 October 1, 2021

Suppose we have a random sample of 8 people, in which each person can be infected independently with probability 0.1

(1) If  $X$  is the number of infected people in this sample, write a formula for  $P(X=2)$ .

*Answer:  $28(0.1)^2(0.9)^6=0.1488$*

(2) Find the mean and the variance of  $X$ .

*Answer:  $EX=0.8$   $VarX=0.72$*

(3) If we have a random sample of 80 people, in which each person can be infected independently with probability 0.01, find the Poisson approximation that at least two people are infected in this sample.

*Answer:  $1-e^{-0.8}(1+0.8)=0.1912$*

Extra credit (take home, due Monday 10am): provide numerical answers to questions (1,2,3). You can use a calculator.