

True/False - No explanation needed. (For each: 1 point if correct, 0 points if not answered, -1 points if incorrect)

1. For a geometric random variable, the associated parameter p of success can be estimated by

$$\hat{p} = \frac{1}{\bar{x} + 1}$$

where \bar{x} is the average of our samples. True/False

2. $E(\bar{X}^2) = \frac{\sigma^2}{n} + \mu^2$, where \bar{X} is the sample mean of n i.i.d. copies of X . X has variance σ^2 and mean μ . True/False

Problems - Needs justification.

1. The number of pieces of cereal in a box is well described by a normal variable with unknown mean and standard deviation of 50. If you count the number of pieces of cereal in 16 boxes, what is the probability your sample mean is within 20 of the true mean? Write your answer in terms of numbers of the form $z(k)$. (10 points)