Worksheet 19

1. Let $X \sim N(\mu, \sigma^2)$, with $\sigma^2 > 0$ a fixed and known constant. (a) Compute the Fisher Information $\mathcal{I}(\mu)$. (b) The MLE for μ is equal to X (generally it's the mean, but in the one-observation case the mean is equal to X). Find the efficency of the MLE.

2. Let $X \sim Poisson(\lambda)$. (a) Compute the Fisher Information $\mathcal{I}(\lambda)$. (b) The MLE for λ is equal to X (generally it's the mean, but in the one-observation case the mean is equal to X). Find the efficency of the MLE.

3. Let $X \sim Binomial(n, p)$ with $n > 0$ a fixed and known constant. (a) Compute the Fisher Information $\mathcal{I}(p)$.[1] (b) The MLE for p is equal to X/n. Find the efficency of the MLE.

[1] Try to simplify this as much as possible. You should be able to get something that has a denominator equal to $p(1-p)$.