1: Let $X_1, X_2$, be an independent sample from the Gaussian density with mean $\theta$ and variance 1. Show that $Y_1 = X_1 + X_2$ is a sufficient statistic for $\theta$.

2. (a) Consider $N$ IID observations from the density:
   \[ p(x, \theta) = \exp[A(\theta)B(x) + C(x) + D(\theta)] \]
   Find the equation that must be solved for the maximum likelihood estimate.

   (b) Illustrate the above if
   \[ p(x, \theta) = \theta \exp(-\lambda \theta); \quad x > 0 \]
   \[ 0 \text{ otherwise.} \]