Name:

1. Let $X_1, X_2, ..., X_n$ be a random sample from the following distribution:

$$f(x) = \begin{cases} \dfrac{2x}{\theta} e^{-x^2/\theta}, & x \geq 0, \\ 0, & \text{elsewhere.} \end{cases}$$

Find a sufficient statistic for $\theta$.

2. Let $X_1, X_2, ..., X_n$ be a random sample from the following distribution:

$$f(x) = \begin{cases} \theta x^{\theta - 1}, & 0 \leq x \leq 1, \\ 0, & \text{elsewhere.} \end{cases}$$

Find a sufficient statistic for $\theta$.

3. Let $X_1, X_2, ..., X_n$ be a random sample from the following distribution:

$$f(x) = \begin{cases} e^{-(x-\theta)}, & x \geq \theta, \\ 0, & \text{elsewhere.} \end{cases}$$

Find a sufficient statistic for $\theta$.