UNIVERSITY OF TEXAS AT AUSTIN

Quiz #5

Please, provide your **complete solutions** to the following problems. Providing just the final answer will earn you zero points even if the answer is correct.

Problem 5.1. (10 points) Consider the following individual observed values:

$$5, 8, 10$$

of a random variable Y such that $Y = X^{-1}$ with $X \sim Gamma(\alpha = 2, \theta)$.

Calculate $\hat{\theta}$, the maximum likelihood estimate of the parameter θ based on the above observed values.

Problem 5.2. (5 points) A sample of n independent observations

$$x_1, x_2, \ldots, x_n$$

came from a distribution with the probability density function $f_x(x) = 2\theta e^{-\theta x^2}, x > 0$. Determine the maximum likelihood estimator of θ.