

Probability and Statistics Exam, 9

- 1) The battery of a particular car brand starts with probability 0.95. Find the probability of the following events:
 - a) (1 point) A : the battery only starts on the 5th attempt;
 - b) (2 points) B : the battery starts on the first at least 20 consecutive attempts.

- 2) (2 points) Let $X \in \text{Exp}(\mu)$. Find the pdf of $Y = \sqrt{X}$.

- 3) Let X_1, X_2, \dots, X_n be a random sample drawn from a distribution with pdf $f(x; \theta) = \frac{2}{\theta^2}x$, for $0 < x < \theta$, with $\theta > 0$ unknown.
 - a) (2 points) Find the method of moments estimator, $\hat{\theta}$, for θ .
 - b) (2 points) Is $\hat{\theta}$ an absolutely correct estimator? Explain.