

Probability and Statistics Exam, 8

- 1) A basketball player makes a free throw with probability 0.7. Find the probability of the following events:
- a) (1 point) A : the player makes his first free throw only on the 4th shot;
 - b) (2 points) B : the player makes the first at least 10 consecutive free throws.
- 2) (2 points) Let $X \in N(0, 1)$. Find the pdf of $Y = X^2$. What type of distribution is it?
- 3) Let X_1, X_2, \dots, X_n be a random sample drawn from a distribution with pdf $f(x; \theta) = \frac{1}{\theta}$, 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.