

### Homework 7 (additional problems)

Introduction to Probability - MATH/STATS 425, Winter 2012

1. Let  $X \sim \text{Unif}[0, 1]$ . Compute the pdf of the following random variables:
  - (a)  $X^3$
  - (b)  $\ln X$
2. Let  $X \sim \text{Unif}[-1, 1]$ . Compute first cdf, and then pdf of  $X^2$ .  
(Careful: the function  $y = x^2$  is not monotone on  $[-1, 1]$ .)
3. Consider a point  $P$  chosen at random (uniformly) from the semicircle  $\{x^2 + y^2 = 1, y \geq 0\}$ . Compute the pdf of the  $x$ -coordinate of  $P$ .  
(Hint: what is the distribution of the angle  $\theta$  that defines the point  $P$ ?)

