

AMS 131: Quiz 6

Name: _____

(Note that part (e) of this question is on the second page.)

In a problem you're working on, you need to simulate random draws from the following PDF for the continuous random variable Y :

$$f_Y(y) = \begin{cases} \frac{1}{2}(2y + 1) & \text{for } 0 \leq y \leq 1 \\ 0 & \text{otherwise} \end{cases}. \quad (1)$$

- (a) Sketch the PDF in equation (1) for y in the interesting range $[0, 1]$.
- (b) Work out the CDF $F_Y(y)$ for Y , specifying its values for all $-\infty < y < +\infty$, and sketch it in the interesting range $0 \leq y \leq 1$.
- (c) Work out the inverse CDF (quantile function) $F_Y^{-1}(p)$ for Y , specifying its values for all $0 < p < 1$, and sketch it for p in that range.
- (d) Using the result presented in Discussion Section 6 that demonstrates how to employ the quantile function of a random variable Y to generate random draws from its PDF $f_Y(y)$, and building on your result in part (c), explicitly specify how you can generate IID random draws from the PDF in equation (1).

- (e) Once you have your random sample in part (d), briefly explain how you could graphically check whether it really *is* a sample from the PDF in equation (1).