

Your name: _____

Quiz no. 5 (3160 Probability, Fall 2009)
October 30, 2009

20 min.

1. (5 points) If X is a uniform random variable distributed over $(0, 3)$, what is the probability density function $f_Y(y)$ of $Y = X^3$?

2. (5 points) The joint probability density function for two random variables X, Y is given by

$$f(x, y) = \frac{3}{2}x^2 + 2xy \quad 0 < x < 1, 0 < y < 1$$

- (a) Are X, Y independent? Give a reason for your answer.
- (b) Compute the density function $f_X(x)$ of X .

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3. (*5 points*) The lifetimes of batteries A and B in years are exponential random variables with $\lambda_A = 1$ and $\lambda_B = 2$, respectively. What is the probability that battery B will last longer than battery A? What assumption are you making?