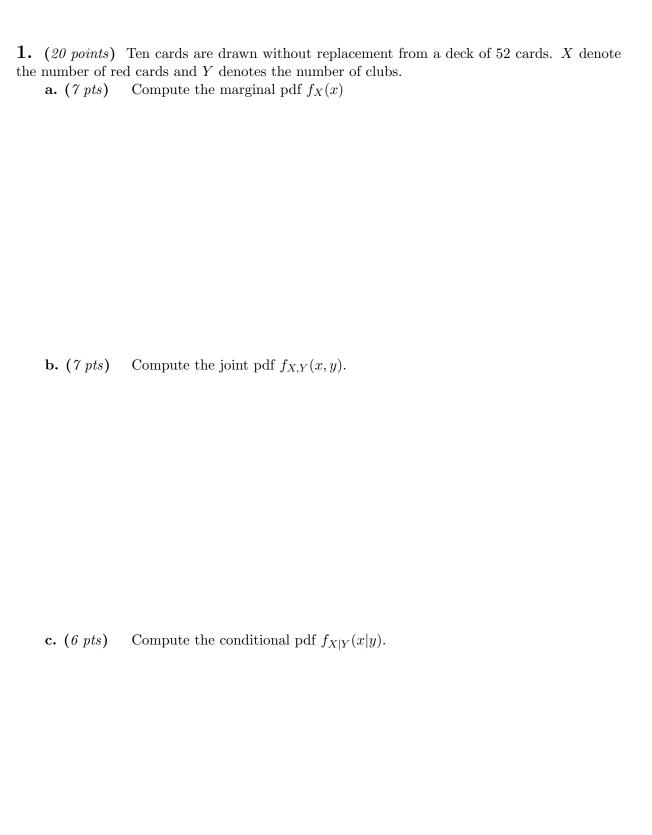
Midterm Exam II

Math 361	Name:
9/27/10	

Read all of the following information before starting the exam:

- READ EACH OF THE PROBLEMS OF THE EXAM CAREFULLY!
- Show all work, clearly and in order, if you want to get full credit. I reserve the right to take off points if I cannot see how you arrived at your answer (even if your final answer is correct).
- \bullet A single 8 1/2 \times 11 sheet of notes (double sided) is allowed. Calculators are permitted.
- Circle or otherwise indicate your final answers.
- Please keep your written answers clear, concise and to the point.
- This test has . problems and is worth 100 points. It is your responsibility to make sure that you have all of the pages!
- Turn off cellphones, etc.
- READ EACH OF THE PROBLEMS OF THE EXAM CAREFULLY!
- Good luck!

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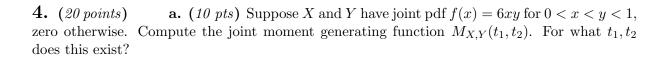


2.	(20 points)	X and Y are	continuous random	variables with	$f_{X,Y} = 9e^{-x}y^{-1}$	for $0 < x < \infty$
1 <	$y < \infty$ and	0 otherwise.	a. (10 pts)	Compute $\mathbb{E}[X]$	$[X]$, and $\mathbb{E}[XY]$	

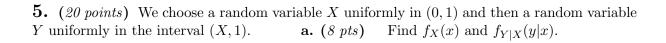
b. (10 pts) Suppose $Z_1 = X + Y$ and $X_2 = Y$. Find the joint pdf $f_{Z_1,Z_2}(z_1,z_2)$.

3. (20 points) X is a random variable with $\mathbb{E}[X] = 100$ and Var(X) = 20. Let Y = 10X. **a.** (10 pts) Estimate $\mathbb{P}(X < 0 \text{ or } X > 200)$.

b. (10 pts) Let Y = 10X. Compute $\mathbb{E}[Y]$ and Var(Y).



b. (10 pts) A random variable X has moment generating function $M(t) = \frac{e^t}{2-e^t}$. Compute Var(X).



b. (6 pts) Find the joint pdf
$$f_{X,Y}(x,y)$$
.

c. (6 pts) Compute
$$\mathbb{E}[X|Y = y]$$

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