Math 104	Name(PRINT!)	
Midterm 3, April 7		

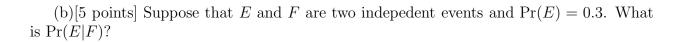
- 1. Each of three people randomly chooses one of three calculus sections to take (A, B, or C).
  - (a) [10 points] What is the probability that they all choose the same one?

(b)[10 points]What is the probability that they each choose a different section?

Pr	<b>2.</b> Let $S$ be a sample space and $E$ and $F$ events associated with $S$ . Suppose $r(E) = 0.5$ , $\Pr(F) = 0.3$ , and $\Pr(E \cap F) = 0.1$ . (a)[5 points] Calculate $\Pr(E F)$ and $\Pr(F E)$ .	that
	(b)[5 points] Are $E$ and $F$ independent events? Explain.	
	(c) Calculate $Pr(E F')$ .	
	(d) Calculate $\Pr(E' F')$ .	

3. (a)[5 points] State De Morgan's Laws.	
(b)[5 points] State Complement Rule.	
(c)[5 points] State Inclusion-Exclusion Principle (the one for probability, not for set and counting).	
(d)[5 points] Show that if events $E$ and $F$ are indepedent of each other, so are $E'$ and $F'$ .	





(c)[5 points] Suppose that 
$$E$$
 and  $F$  are two identical events, namely  $E=F$ . What is  $\Pr(E|F)$ ?

<sup>(</sup>d)[5 points] Suppose that F and F are two complementary events, namely E=F'. What is  $\Pr(E|F)$ ?

 ${f 5.}$  Suppose that a random variable X has probability distribution given by the following table:

k	$\Pr(X = k)$
-1	0.2
0	0.3
1	0.1
2	0.4

- (a)[5 points] What are the possible values of the random variable X?
- (b)[5 points] What are the possible values of the random variable  $X^2$ ?
- (c)[5 points] Determine the probability distribution of the random variable  $X^2$ .

(d)[5 points] Draw the histogram of the probability distribution of  $X^2$ .