Conditional Probability Practice Problems

Question 1 pertains to drug screening for airline pilots. Suppose only 1% of airline pilots who get tested for drugs are really using them. If a pilot is using drugs, 90% of the time he'll correctly fail the test. But 10% of the clean pilots will also fail the test. Fill in the following table for 1000 pilots who get tested (8 pts)
Fill in the rest of the table:

	Fail Test	**Pass Test**	**Total**
Drug Users			**10**
Clean			**990**
Total			**1000**

b) If a pilot fails the test, what is the chance he or she is really clean? _____ (leave answer as a fraction)

c) If a pilot passes the test what is the chance he or she is really using drugs?_____ (leave answer as a fraction)

Question 2 pertains to the table below which shows how males and females in this class answered the survey question "Who do you plan to vote for?"

	Obama	McCain	Undecided/Other	Won't Vote	Totals
Males	84	31	33	25	173
Females	247	60	69	41	417
Totals	331	91	102	66	590

Suppose you draw **randomly from the students who answered this survey**: ***(7 pts)***

a) What is the chance that you'll get a student voting for Obama?

b) What is the chance that you'll get a student voting for McCain?

c) What is the chance of getting a student who is voting for McCain if you draw only from the female voters?

d) What is the chance of getting a student who is voting for McCain if you draw only from the male voters?

e) What is the chance of getting a male student if you draw only from the McCain voters?

f) What is the chance of getting a female student if you draw only from the Obama voters?

g) What is the chance that a randomly selected student is either for Obama or Undecided/Other?

h) What is the chance that a randomly selected student is either for Obama or female?

i) Draw 3 students ***with replacement***. What is the chance that all are Obama voters?

j) Draw 3 students ***with replacement***. What is the chance that not all are Obama voters?

k) Draw 3 students ***without replacement***. What is the chance that none are Obama voters?

l) Draw 3 students ***without replacement***. What is the chance that at least one is an Obama voter?

Conditional Probability Practice Problems

Question 1 pertains to drug screening for airline pilots. Suppose only 1% of airline pilots who get tested for drugs are really using them. If a pilot is using drugs, 90% of the time he'll correctly fail the test. But 10% of the clean pilots will also fail the test. Fill in the following table for 1000 pilots who get tested

Fill in the rest of the table:

	Fail Test	**Pass Test**	**Total**
Drug Users	**.90(10) = 9**	**1**	**10**
Clean	**.10(990) =99**	**990-99=891**	**990**
Total	**99+9=108**	**892**	**1000**

a) If a pilot fails the test, what is the chance he or she is really clean? ___99/108_____ (leave answer as a fraction)

b) If a pilot passes the test what is the chance he or she is really using drugs? 1/892 (leave answer as a fraction)

Question 2 pertains to the table below which shows how males and females in this class answered the survey question "Who do you plan to vote for?"

	Obama	McCain	Undecided/Other	Won't Vote	Totals
Males	84	31	33	25	173
Females	247	60	69	41	417
Totals	331	91	102	66	590

Suppose you draw **randomly from the students who answered this survey**:

a) What is the chance that you'll get a student voting for Obama? 331/590

b) What is the chance that you'll get a student voting for McCain? 91/590

c) What is the chance of getting a student who is voting for McCain if you draw only from the female voters? 60/417

d) What is the chance of getting a student who is voting for McCain if you draw only from the male voters? 31/173

e) What is the chance of getting a male student if you draw only from the McCain voters? 31/91

f) What is the chance of getting a female student if you draw only from the Obama voters? 247/331

g) What is the chance that a randomly selected student is either for Obama or Undecided/Other? (331 + 102)/590

h) What is the chance that a randomly selected student is either for Obama or female? (331 + 417 -247)/590

i) Draw 3 students ***with replacement***. What is the chance that all are Obama voters? $(331/590)^3$

j) Draw 3 students ***with replacement***. What is the chance that not all are Obama voters? $1 - (331/590)^3$

k) Draw 3 students ***without replacement***. What is the chance that none are Obama voters?
There are (91 + 102 + 66)= 259 non- Obama voters so answer is : 259/590 * 258/589 * 257/588

l) Draw 3 students ***without replacement***. What is the chance that at least one is an Obama voter?
1 - 259/590 * 258/589 * 257/588