STAT 308 - Handout # 9

4.6 The Multiplication Rule; Independence

Ex. A joint frequency dist'n for the number of injuries in the US by circumstance and sex is as shown in the following contingency table. Frequencies are in millions.

Circumst. / Sex	**Work C_1**	**Home C_2**	**Other C_3**	**Total**
Male S_1	8		178	356
Female S_2		116	129	258
TOTAL	93	214	307	614

a. Fill in the two empty cells

b. How many cells does the contingency table have?

c. Find the probability $P(C_1)$ and $P(S_2)$

d. Find the probability $P(C_1 \cap S_2)$

e. Obtain $P(S_2|C_1)$ directly from the table

f. Obtain $P(S_2|C_1)$ using the conditional probability rule and your answers from part (c) and (d).

g. Are S_2 and C_1 independent? Explain.
Hence, C_1 and S_2 are not independent.

h. Obtain $P(S_2 \cap C_1)$ using the multiplication rule and your answers from parts (c) and (e).

i. State your results in parts (c) - (e) in words.