Himanshu Rane
4/8
MA 331 thw #7
"I pledge my honor that I have abided by the Stevens Honor System" – Himanshu Rane

1) a)

Lied at least once	Gender: female	male	
yes	121	110	231
no	70	65	135
	191	175	366

Gender
female: $191/366 = .522$
male: $175/366 = .478$

Lied
yes: $231/366 = .631$
no: $135/366 = .369$

b) female lied: $121/231 = .524$ female no lie: $70/135 = .519$
male lied: $110/231 = .476$ male no lie: $65/135 = .481$

c) H_0: V_1 is independent from V_2 $\alpha = .05$
H_1: V_1 is not independent from V_2

Lied at least once	Gender: female	male	
yes	120.5	110.5	231
no	70.5	64.5	135
	191	175	366

df: $(2-1)(2-1) = 1$
$\chi^2_{.95} = 3.84$

.011 is not greater than 3.84 (K_c) so we do not reject H_0

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(n_{ij} - e_{ij})^2}{e_{ij}} = .011746$$

2) a)

	Withdrawals	Non Withdrawals	
Year 1	600	1800	2400
Year 2	517	1833	2350
Year 3	464	1856	2320
	1581	5489	7070

b) H_0: V_1 is independent from V_2 $\alpha = .01$

H_1: V_1 is not independent from V_2

	Withdrawals	Non Withdrawals	
year 1	536.69	1863.31	2400
Year 2	525.51	1824.49	2350
year 3	518.80	1801.20	2320
	1581	5489	7070

$$X^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(n_{ij} - e_{ij})^2}{e_{ij}} = 17.25$$

df: $(3-1)(2-1) = 2$ $\quad X^2_{obs} > X^2$ and P-val $< \alpha$

$17.25 > 9.21$ and $.00018 < .01 \rightarrow$ Reject H_0

Withdrawals and revisions are indep.

c) yes, the course revisions were successful in reducing # of withdrawals because p-value 0.00018 is less than α