MA 207 Contingency Tables **Name: _____Key_____ Date:_____Time:_____**

1. Below is a contingency table for passengers on the Titanic that cross-tabulates ticket class with survival status.

	Survived	Died	Total
First Class	203	122	325
Second Class	114	243	357
Third Class	182	452	634
Total	499	817	1316

a. Is class a categorical or quantitative variable?
b. Is survival status categorical or quantitative?
c. Identify the explanatory variable. Class
d. Identify the response variable. Survival status

For each part below, give your answer as a fraction, then as a decimal rounded to two decimal places, then as a percent rounded to the nearest percent. Also circle the type of proportion you used to answer the question.

e. What proportion of passengers were in first class? This is a joint / marginal / conditional proportion.
$\frac{325}{1316} = .25 = 25\%$

f. What proportion of passengers survived? Joint / marginal / conditional proportion
$\frac{499}{1316} = .38 = 38\%$

g. What proportion of passengers were in first class and survived? Joint / marginal / conditional proportion
$\frac{203}{1316} = .15 = 15\%$

h. What proportion of passengers were in first class or survived? (This kind of proportion doesn't have a name.)
$\frac{203+114+182+122}{1316} = \frac{621}{1316} = .47 = 47\%$ (or you could do $499 + 325 - 203$ to get 621)

i. What proportion of survivors were first-class passengers? Joint / marginal / conditional proportion
$\frac{203}{499} = .41 = 41\%$

j. What proportion of first-class passengers survived? Joint / marginal / conditional proportion
$\frac{203}{325} = .62 = 62\%$

k. What proportion of second-class passengers survived? Joint / marginal / conditional proportion
$\frac{114}{357} = .32 = 32\%$

l. What proportion of third-class passengers survived? Joint / marginal / conditional proportion
$\frac{182}{634} = .29 = 29\%$

m. Fill in the contingency table below with the *conditional proportions on survival status, given class* (some of your work above is useful). Give your answers as decimals to two decimal places.

	Survived	Died
First Class	.62	.38
Second Class	.32	.68
Third Class	.29	.71

n. True or false: there seems to be an association between survival and class. If there were no association, the conditional proportions on survival status would be the same in each class.

o. True or false: Since more third class passengers survived than second class passengers, it was safer to be in third class than in second class.
It is not the number of survivors but the proportion of survivors that matters.

p. What is the ratio of proportions between survivors in first class and third class? Round the final answer to two decimal places, but do NOT round intermediate calculations.

$\frac{203/325}{182/634} \approx 2.18$ You are more than twice as likely to survive in first class as third class.

Do you get the same answer if you round intermediate calculations to two decimal places? No!! $\frac{.62}{.29} \approx 2.14$

q. What is the difference in proportions between survivors in first class and third class (to two decimal places)?

$\frac{203}{325} - \frac{182}{634} = .34$ We say survival differs by .34 or by 34 *percentage points* (NOT that it differs by 34 *percent*).

r. What is the ratio of proportions between survivors in second class and third class (to two decimal places)?

$\frac{114/357}{182/634} \approx 1.11$ You are 1.11 *times as likely* to survive in second class as third class. You can also say you are 11% *more likely* to survive in second class as in third class.

s. What is the difference in proportions between survivors in second class and third class (to two decimal places)?

$\frac{114}{357} - \frac{182}{634} = .03$ We say survival differs by .03 or by 3 *percentage points* (NOT that it differs by 3%).