

Name: \_\_\_\_\_

**Problem Set 7.1-2 Review and Enrich**

**1.) Titanic Data Revisited**

This problem is based on Illustrative Mathematics Common Core State Standards S-CP The Titanic 3.

We have looked at survival data from the Titanic twice, but only broken down by the class/deck of passenger. Here is a more detailed data table that shows survival frequencies based on class and whether the passenger was a child, woman, or man.

	Survived	Did not survive	Total
Children in first class	6	0	6
Women in first class	140	4	144
Men in first class	57	118	175
Children in second class	24	0	24
Women in second class	80	13	93
Men in second class	14	154	168
Children in third class	27	52	79
Women in third class	76	89	165
Men in third class	75	387	462
<b>Total</b>	<b>498</b>	<b>818</b>	<b>1316</b>

Source: British Parliamentary Papers, Shipping Casualties (Loss of the Steamship "Titanic") 1912, cmd 6352  
*'Report of a Formal Investigation into the circumstances attending the foundering on the 15<sup>th</sup> April 1912, of the British Steamship "Titanic" of Liverpool, after striking ice in or near Latitude 41°46'N., Longitude 50°14'W., North Atlantic Ocean, whereby loss of life ensued.'* (London: His Majesty's Stationery Office, 1912), page 42

In Problem Set 7.2, you found that first class passengers were more likely to survive than second class, and second class more so than third. Some might believe that the rescue procedures were biased based on class. However, Victorian mortality would have required the lifeboats be loaded with "woman and children first."

Based on the data, who do you think was given priority in boarding the lifeboats? Write an argument that **includes calculation** to support your conjecture and be sure to analyze both aspects of the data: sex/age and class. Note: there are many ways to approach this problem, and you might want to make several different types of calculations before starting to write your analysis. You will be presenting your results to your classmates and will be given 3 minutes to make justify your conjecture with supporting evidence (calculations).

2.) (Extension of number 1)

The table gives additional data on crew survival, which now allows us to address the entire ship population of 2,224 passengers.

	Survived	Did not survive	Total
Women in crew	20	3	23
Men in crew	192	693	885

Given this data and the previous table, which category (row) of people had the lowest relative frequency of survival? Why do you think that might be the case? Use this additional data to amend your earlier calculations by including “crew” in the possible classes of passengers, and then including crew women with the rest of the women, and crew men with the rest of the men.

3.) Out of an advisory of 10 students, some made varsity sports teams and some were chosen for honor role (some were picked for both). Here are the rosters:

ADVISORY ROSTER	PICKED FOR VARISTY SPORT	PICKED FOR HONOR ROLL
ADAM	ADAM	ANNA
ANNA	ANNA	KIM
CELESTE	CELEST	THOMAS
KIM	KIM	
LUCIA	MIGUEL	
MIGUEL	MING	
MING		
SEBASTIAN		
SYLVIA		
THOMAS		

a) If you were asked to find the relative frequency of this advisory group of students on a varsity sport **and** honor roll, which of the following two strategies would **you** prefer and why? Discuss with your groups.

**Strategy 1:** Go down the advisory roster, mark all the kids that made Varsity with a V. Then go down the list again, and mark all the kids that made Honor Roll with an H. Go down the list again, and count the number of kids that have VH next to their name, divide by the size of the advisory group.

**Strategy 2:** Go down the varsity list and mark the kids that are also on Honor Roll with an H. Count those students, and divide by the size of the advisory group.

b) What is the relative frequency of advisory students on varsity **AND** honor roll?

c) What is the relative frequency of advisory students on varsity **OR** honor roll?

4.) Use the relative frequency table below to answer the following questions.

	Ever Bullied		
Height	Yes	No	Total
Short	0.20	0.24	0.44
Not Short	0.14	0.42	0.56
Total	0.34	0.66	1

Data set provided by Floyd Bullard

Source: *Statistical Ideas and Methods*, Utts and Heckard, p. 166; England, Voss and Mulligan (2000)

a) Let's investigate the relative frequency of kids that meet the description identifying as short **OR** being bullied.

Consider the validity of the statement:

$$RF(\text{Short OR Bullied}) = RF(\text{Short}) + RF(\text{Bullied})$$

Is the statement true or not? Justify your answer with calculations.

b) Use your finger to trace the row and then the column that represents the kids you included to get  $RF(\text{Short}) + RF(\text{Bullied})$ . What cell did you cross twice, meaning it was double counted? What group of kids does that represent?

c) Fix your answer in part (a) by subtracting the value of the cell you double counted. That is  $RF(\text{Short OR bullied})$ .

d) How would you describe the group of kids that does not satisfy either of the conditions short or bullied using RF notation? What is the RF of that group (hint: you can read it from the chart)

e) What is the relationship between the answers to (c) and (d)? Why?

