

Practice Problems Section 3B

Formulas

Single Variable Marginal Proportion = Total for Row or Column \div Grand Total

“AND” Intersecting Proportion = Amount where row and column intersect \div Grand Total

“OR” Union Proportion = Add up all of the values in the row or column without using totals \div Grand Total

“OR” Union Proportion = (Row Total + Column Total – Intersection amount) \div Grand Total

“OR” Union Proportion = 1st Variable Proportion + 2nd Variable Proportion – Intersecting “AND” Proportion

To convert a proportion into a percentage, multiply by 100%.

Directions #1-12: The following contingency table was created from the Math 075 Survey Data Fall 2015 and describes the student’s favorite social media and whether or not they have a tattoo. Use the table to find the given proportions and percentages. Show your work.

Tattoo (at least one)? \ Social Media favorite?	Twitter	Instagram	Facebook	Snapchat	Other	Total
Yes	13	38	33	15	9	108
No	78	99	66	79	29	351
Total	91	137	99	94	38	459

Basic Marginal Proportions

- How many students have at least one tattoo?
 - What proportion of the students have a tattoo?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
 - What percentage of the students have a tattoo.
(Show how you calculated the answer. Round your percent to the tenths place.)
- How many students prefer Facebook?
 - What proportion of the students prefer Facebook?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
 - What percentage of the students prefer Facebook?
(Show how you calculated the answer. Round your percent to the tenths place.)
- How many students do not have a tattoo?
 - What proportion of the students do not have a tattoo?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
 - What percentage of the students do not have a tattoo?
(Show how you calculated the answer. Round your percent to the tenths place.)



4.
 - a) How many students prefer Instagram?
 - b) What proportion of the students prefer Instagram?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
 - c) What percentage of the students prefer Instagram?
(Show how you calculated the answer. Round your percent to the tenths place.)

Joint Proportions “AND”

Tattoo (at least one)? \ Social Media favorite?	Twitter	Instagram	Facebook	Snapchat	Other	Total
Yes	13	38	33	15	9	108
No	78	99	66	79	29	351
Total	91	137	99	94	38	459

5.
 - a) How many students both have a tattoo and prefer Facebook?
 - b) What proportion of the students both have a tattoo and prefer Facebook?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
 - c) What percentage of the students both have a tattoo and prefer Facebook?
(Show how you calculated the answer. Round your percent to the tenths place.)

6.
 - a) How many students both do not have a tattoo and prefer Instagram?
 - b) What proportion of the students both do not have a tattoo and prefer Instagram?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
 - c) What percentage of the students both do not have a tattoo and prefer Instagram?
(Show how you calculated the answer. Round your percent to the tenths place.)

7.
 - a) How many students both do not have a tattoo and prefer Snapchat?
 - b) What proportion of the students both do not have a tattoo and prefer Snapchat?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
 - c) What percentage of the students both do not have a tattoo and prefer Snapchat?
(Show how you calculated the answer. Round your percent to the tenths place.)

8.
 - a) How many students both have a tattoo and prefer “Other” social media?
 - b) What proportion of the students both have a tattoo and prefer “Other” social media?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
 - c) What percentage of the students both have a tattoo and prefer “Other” social media?
(Show how you calculated the answer. Round your percent to the tenths place.)



Joint Proportions “OR”

Tattoo (at least one)? \ Social Media favorite?	Twitter	Instagram	Facebook	Snapchat	Other	Total
Yes	13	38	33	15	9	108
No	78	99	66	79	29	351
Total	91	137	99	94	38	459

9. a) How many total students either have a tattoo or prefer Facebook?
(Show how you calculated the answer.)
- b) What proportion of the students either have a tattoo or prefer Facebook?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
- c) What percentage of the students either have a tattoo or prefer Facebook?
(Show how you calculated the answer. Round your percent to the tenths place.)
10. a) How many students either do not have a tattoo or prefer Instagram?
(Show how you calculated the answer.)
- b) What proportion of the students either do not have a tattoo or prefer Instagram?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
- c) What percentage of the students either do not have a tattoo or prefer Instagram?
(Show how you calculated the answer. Round your percent to the tenths place.)
11. a) How many students prefer either Twitter or Snapchat?
(Show how you calculated the answer.)
- b) What proportion of the students prefer either Twitter or Snapchat?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
- c) What percentage of the students prefer either Twitter or Snapchat?
(Show how you calculated the answer. Round your percent to the tenths place.)
12. a) How many students either have a tattoo or prefer “Other” social media?
(Show how you calculated the answer.)
- b) What proportion of the students either have a tattoo or prefer “Other” social media?
(Show how you calculated the answer. Round your proportion to the thousandths place.)
- c) What percentage of the students either have a tattoo or prefer “Other” social media?
(Show how you calculated the answer. Round your percent to the tenths place.)



13. Copy and paste the gender and month data taken columns from the “Bear” data into StatKey. Use StatKey to calculate the following. Let gender represent the rows and the month data taken represent the columns.

Directions for creating contingency table with StatKey from Raw Data:

- Open the “Math 075 Survey Data Fall 2015”. Copy and paste the two columns next to each other in a new spreadsheet. Then copy both columns together.
- Go to www.lock5stat.com and click on “StatKey”. Under the “Descriptive Statistics and Graphs” menu, click on “Two Categorical Variables”. Click the “Edit Data” button. Push “Control A” and “Delete” on your keyboard to delete out any existing data. Then paste in your two columns of data. Check the box that says “Raw Data”. If your data has a title, check the box that says “Data has a header row”. Then push “OK”.
- Click on the “Overall” proportions button and use the proportions provided to answer the questions.

- a) What proportion of the bears had data taken in September? Convert the proportion into a percentage.
- b) What proportion of the bears were female? Convert the proportion into a percentage.
- c) What proportion of the bears were both female and had data taken in September? Convert the proportion into a percentage.
- d) What proportion of the bears were either female or had data taken in September? Use the following formula and your answers from parts (a), (b) and (c). Convert the proportion into a percentage.

“OR” Union Proportion = 1st Variable Proportion + 2nd Variable Proportion – Intersecting “AND” Proportion

14. Type in the following contingency table into StatKey and use the “Overall Proportions” button in StatKey to calculate the following proportions.

Directions for putting a contingency table into StatKey:

- Go to www.lock5stat.com and click on “StatKey”. Under the “Descriptive Statistics and Graphs” menu, click on “Two Categorical Variables”.
- Click the “Edit Data” button. Push “Control A” and “Delete” on your keyboard to delete out any existing data. Then type in the contingency table with commas as seen below. Do NOT check the box that says “Raw Data”. Check the box that says “Data has a header row”. Then push “OK”.
- Click on the “Overall” proportions button and use the proportions provided to answer the questions.

Contingency Table (Credit Card by Server)

[Blank], Cash, Credit Card

Server A, 39, 21

Server B, 50, 15

Server C, 17, 15

- a) What proportion of the bills were paid with cash? Convert the proportion into a percentage.
- b) What proportion of the bills had server B as the server? Convert the proportion into a percentage.
- c) What proportion of the bills were both served by server B and paid in cash? Convert the proportion into a percentage.
- d) What proportion of the bills were either served by server B or paid in cash? Use the following formula and your answers from parts (a), (b) and (c). Convert the proportion into a percentage.

“OR” Union Proportion = 1st Variable Proportion + 2nd Variable Proportion – Intersecting “AND” Proportion



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