Name: Key
CC ALGEBRA 2

Date: 5/11/18
TROICI

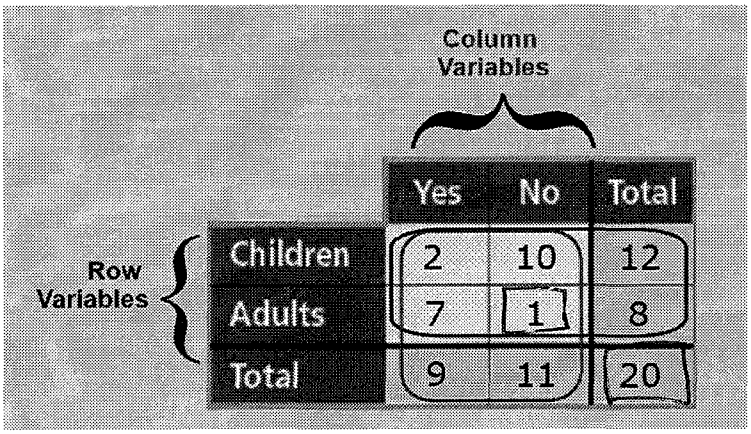
1, 2, 5, 6, 8, 9, 10

LESSON #1: TWO WAY TABLES

To Now: If there is a 25% chance it will rain today, what is the chance that it *will not* rain?

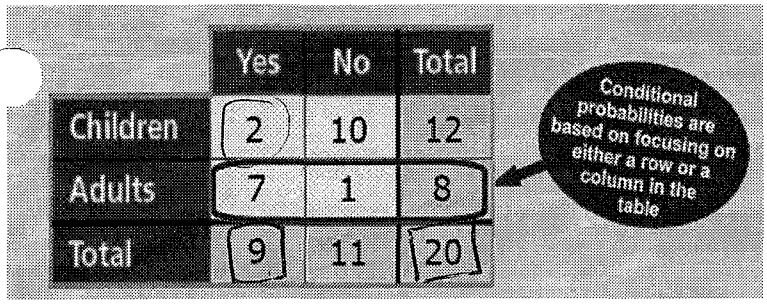
100 - 25 = 75% chance

A **two-way table** is a useful way to organize data that can be categorized by two variables. Suppose you asked 20 children and adults whether they liked broccoli. The table below shows one way to arrange the data.



- **Joint Relative Frequency:** The likelihood of **two events** happening simultaneously compared to the **total population**.
- **Ex #1:** What is the probability that an adult does not like broccoli?

$\frac{1}{20} = .05 = 5\%$



- **Marginal Relative Frequency:** Comparing **one category** total to the **total population**
- **Ex #2:** If a person is chosen at random from this survey, what is the probability they like broccoli?

$\frac{9}{20} = .45 = 45\%$

- **Conditional Probability:** Not based on the whole population, but rather a specific subgroup within the whole population that is represented by a **row total** or a **column total**.
  - ❖ Suppose that a randomly selected person is an adult. What is the probability that the selected adult does not like broccoli?

    1 / 8

    $\frac{1}{8} = .125 = 12.5\%$
  - ❖ How would we interpret the conditional relative frequency?

    12.5% of adults do not like broccoli
  - ❖ Suppose that a randomly selected person likes broccoli. What is the probability that the selected person is a child?

    2 / 9

    $\frac{2}{9} = .\overline{2} \approx 22\%$

1. A group of 262 students was polled and asked the question, "If you drink soda, do you prefer a diet version?" The responses of those who did drink soda are shown in the two-way table below.

Prefer diet?	Female	Male	All
No	72	96	168
Yes	58	36	94
All	130	132	262

1. Suppose we chose a survey respondent at random. What is the probability that the person is female, given that the person preferred diet soda?

58 $\frac{58}{94} = .6170 \approx$ 61.7%

2. Suppose we chose a survey respondent at random. What is the probability that the person preferred diet soda, given that the person is female?

$\frac{58}{130} = .4461 \approx$ 44.6%

3. If one of the students is randomly selected, what is the probability that this student is a female and prefered diet?

ONE $\frac{58}{262} = .2213 \approx$ 22.1%

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7 The set of data in the table below shows the results of a survey on the number of messages that people of different ages text on their cell phones each month.

Age Group	Text Messages per Month		
	0–10	11–50	Over 50
15–18	4	37	68
19–22	6	25	87
23–60	25	47	157

157/229

229

If a person from this survey is selected at random, what is the probability that the person texts over 50 messages per month given that the person is between the ages of 23 and 60?

(1) $\frac{157}{229}$

(2) $\frac{157}{312}$

(3) $\frac{157}{384}$

(4) $\frac{157}{456}$

2. On April 15, 1912, the Titanic struck an iceberg and rapidly sank with only 710 of her 2,204 passengers and crew surviving. Data on survival of *passengers* are summarized in the table below.

	Survived	Did not survive	Total
First class passengers	201	123	324
Second class passengers	118	166	284
Third class passengers	181	528	709
Total passengers	500	817	1317

8. Calculate the following probabilities. Round your answers to three decimal places.

a. If one of the passengers is randomly selected, what is the probability that this passenger was in first class?

$\frac{324}{1317} = .246$

b. If one of the passengers is randomly selected, what is the probability that this passenger survived?

$\frac{500}{1317} = .3796 = .380$

c. If one of the passengers is randomly selected, what is the probability that this passenger was in first class and survived?

$\frac{201}{1317} = .153$

d. If one of the passengers is randomly selected from the first class passengers, what is the probability that this passenger survived? (That is, what is the probability that the passenger survived, given that this passenger was in first class?)

201 324

$\frac{201}{324} = .620$

e. If one of the passengers who survived is randomly selected, what is the probability that this passenger was in first class?

500

$\frac{201}{500} = .402$

f. If one of the passengers who survived is randomly selected, what is the probability that this passenger was in third class?

500 181

$\frac{181}{500} = .362$

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LESSON #1: EXIT TICKET

$\frac{}{6}$

1. The table below shows the results of a survey in which young adults ages 18-26 were asked if they ever used social media. Use the table to answer the question below.

	Female	Male	
Used Social Media	153	126	
Never Used Social Media	39	32	71

What is the conditional probability that the randomly selected person is a female given they never used social media?

a. $\frac{39}{350}$ b. $\frac{39}{71}$ c. $\frac{192}{350}$ d. $\frac{153}{279}$

2

2. Use the two way table below to answer the following questions:

	Gender		
	Male	Female	Total
Going to College	16	13	29
Not Going to College	14	9	23
Total	30	22	52

58

- What is the probability that a randomly selected person is a female given they are going to college?

$\frac{13}{29} = .448 = 44.8\%$

2

- How would we interpret the conditional relative frequency?

44.8 % of students going to college are female.

2