Geometry
Two-Way Frequency Tables

Name: Key
Date: _____

A 2-way frequency table is a useful tool for examining relationships between categorical variables.

1. How many males are in the chorus? 15
2. How many females are in Latin? 9
3. How many students are in the Chess Club? 19
4. What is the total number of females? 57
5. What is the total number of students in the clubs? 135

Participation in School Activities			
School Club	Gender		
	Male	Female	Totals
Band	12	21	33
Chorus	15	17	32
Chess	16	3	19
Latin	7	9	16
Yearbook	28	7	35
Totals	78	57	135

Joint Frequency: an entry in the body of a two-way frequency table.

Marginal Frequency: an entry in the "Total" row or "Total" column in a two-way frequency table.

Example:

Gender	Preferred Sport			Total
	Baseball	Soccer	Basketball	
Male	**49**	**52**	**16**	117
Female	**23**	**64**	**33**	120
Total	72	116	49	237

a. What is the joint frequency of male students who prefer soccer? 52

b. Which marginal frequency is the largest? 120

Example: Sixty-six freshmen responded to a survey with 32 saying that they would be attending the school dance. Of the 84 sophomores that responded, 46 said they would attend. Organize the data into a two-way table and answer the following questions.

1 - Fill in the givens
2 - Add or Subtract to find missing number

Class	Attending	Not Attending	Totals
Freshman	32	34	66
Sophomore	46	38	84
Totals	78	72	150

a. How many students responded to the survey? 150 students

b. How many of the students that were surveyed were attending the dance? 78 students

c. How many of the surveyed sophomores are not attending the dance? 38 students

d. What kind of frequency is the 32? Joint Frequency

e. What kind of frequency is the 78? Marginal Frequency

Example: The data to the right has been collected from the **Pope HS Pep Club**. Fill in the totals and use this to answer the following questions! 😊

	Male	Female	TOTAL
Freshmen	10	15	25
Sophomores	12	20	32
Juniors	21	22	43
Seniors	35	43	78
TOTAL	78	100	178

We are now going to find probabilities!

Let's try one together: What percent of students in the Pep Club are freshman girls? → Part / whole

To solve this, take the total number of freshman girls divided by the grand total of students in the Pep Club. This gives you the **probability**. If you want to find the **percent**, then multiply by 100!

$$\frac{15}{178} = 0.084 \cdot 100 = 8.4\%$$

Let's try some (using the same frequency table above)!

a. What percent of students in the Pep Club are sophomores? $\frac{32}{178} = .1798\,(100) \approx 17.98\%$

b. What is the probability that random student chosen from the Pep Club is a male? $\frac{78}{178} = \frac{39}{89}$

c. What percent of students are female juniors? $\frac{22}{178} = .1236\,(100) \approx 12.36\%$

d. What is the probability that a student chosen is a male senior? $\frac{35}{178}$

Practice: Complete the two- way frequency table below and answer the questions. $X + 23 = 79$

	Attending Prom	Not Attending Prom	Total
Juniors	56	23	79
Seniors	78	15	93
Total	134	38	172

$56 + X = 134$ $\qquad$ $79 + X = 172$

1. How many seniors were surveyed about prom? Is this a joint or marginal frequency? 93 Seniors
2. How many students are not attending prom this year? Is this a joint or marginal frequency? 38 Students
3. How many students responded to the survey about prom? 172 Students
4. What is the probability that a randomly selected student is a junior not attending prom? $\frac{23}{172}$
5. P(attending prom)? $\frac{134}{172} = \frac{67}{86}$
6. P(senior')? $\frac{79}{172}$
7. What percentage of students surveyed are juniors who are attending prom? $\frac{56}{172} = .3256 \approx 32.56\%$
8. P(not attending prom ∪ seniors)? $\frac{38}{172} + \frac{93}{172} - \frac{15}{172} = \frac{116}{172} = \frac{29}{43}$ (union → or)
9. P(not attending prom ∩ seniors)? $\frac{15}{172}$ (intersection → and)