Creating Frequency charts and Venn Diagrams

Steps for frequency chart

- ❑ Identify the categories in the problem
- ❑ Set up a chart with the appropriate number of rows and columns
- ❑ Fill in the information provided
- ❑ Use addition and subtraction to fill in any empty cells
- ❑ Make sure the total matches the given total if provided in the problem.
- ❑ Use the chart to answer probability questions

Set up a frequency chart for the following.

Of the 220 people who came into the Italian deli on Friday, 104 bought pizza and 82 used a credit card. Half of the people who bought pizza used a credit card. What is the probability that a customer bought pizza or used a credit card?

$\frac{104}{2} = 52$

payment method

	Credit Card	not credit	Total
Pizza	52	52	104
not pizza	30	86	116
Total	82	138	220

Did they order pizza?

82 + 138 = 220 ✓

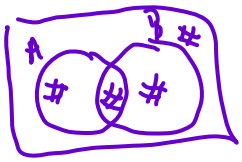
104 + 116 = 220 ✓

$P(\text{Pizza} \cup CC) = P(P) + P(CC) - P(P \cap CC)$

$\frac{104}{220} + \frac{82}{220} - \frac{52}{220} = \frac{134}{220} = \frac{67}{110}$

$= .61$

$= 61\%$



Start with the overlap!

Steps for Venn diagram

- ❑ Identify the categories in the problem
- ❑ Set up a box containing the appropriate number of overlapping circles (usually two in this course)
- ❑ Start with overlapping information in the space where the circles overlap.
- ❑ Use addition and subtract to fill in any empty circles, then put remaining totals outside the circles, but in the box.
- ❑ Make sure the total of all the numbers in the box matches the given total if provided in the problem.
- ❑ Use the diagram to answer probability questions

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

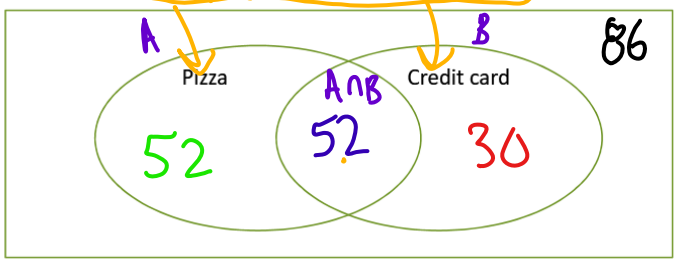
Set up a Venn diagram for the following.

$P(A \cup B) = \frac{134}{220} = \frac{67}{110} = 61\%$

$52 + 52 + 30 = 134$

Of the 220 people who came into the Italian deli on Friday, 104 bought pizza and 82 used a credit card. Half of the people who bought pizza used a credit card. What is the probability that a customer bought pizza or used a credit card?

$\frac{104}{2} = 52$



A − A∩B

Pizza 104

104 − 52 = 52

220 total

B − A∩B

CC

82 − 52 = 30

220 − 52 − 52 − 30 = 86

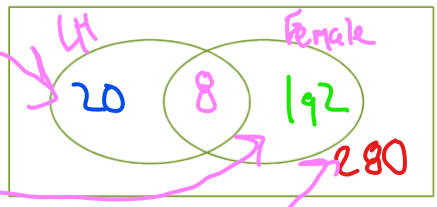
No pizza no CC

Set up a frequency chart and a Venn diagram for the following:
Of 500 athletes surveyed, 300 were male and 20 were left-handed. Only 8 of the left-handed athletes were female.

FREQUENCY CHART

	Male	Female	
LH	20	8	28
RH	280	192	472
	300	200	500

VENN DIAGRAM



You can choose to use which ever one works for you given a probability word problem that gives you raw data only.

GSE Geometry Unit 6 – Applications of Probability 6.5 – Creating Tables

Two-Way Frequency Tables Worksheet Name: _____

Mr. Oglesby keeps track of his students' homework completion. He keeps track of how many boys and girls do not complete their homework. He puts students who don't complete their homework into two categories: first-time offenders and repeat offenders. He uses a table to keep track of the results.

	First-Time Offenders	Repeat Offenders	Total
Boys	12	30	42
Girls	36	12	48
Total	48	42	90

1. In one month, 36 girls and 12 boys did not do their homework for the first time. In the same month, 12 girls and 30 boys did not do their homework again. Record these figures in the table.

2. How many students did not complete all their homework assignments this month? 90 students

3. What percentage of the students who did not complete their homework were boys who were First-Time Offenders? $\frac{12}{90} = \frac{2}{15} \approx .133 = 13.3\%$

4. Are boys or girls more likely to not complete their homework? Explain your reasoning.
Boys $\frac{42}{90}$ = 47% did not complete HW Girls $\frac{48}{90}$ = 53% did not complete HW

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5. Complete the two-way table for 10th Grader's school transportation survey:

	Male	Female	Total
Walk	34	46	80
Car	28	17	45
Bus	15	12	27
Bike	52	17	69
Total	129	92	221

92 − 17 − 12 − 46 = 17

221 − 45 − 27 − 69

6. What percentage of 10th grade girls walk to school? $\frac{46}{92}$ Conditional

7. What percentage of 10th graders are girls who walk to school? $\frac{46}{221}$ AND

8. What percentage of 10th graders ride the bus? $\frac{27}{221}$

9. What percentage of 10th grade boys ride a bike to school? $\frac{52}{129}$ Conditional

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GSE Geometry Unit 6 – Applications of Probability 6.5 – Creating Tables

Heather (a hair stylist) is making a record of all the customers she has had in the last month.

10. Design and label a table that will show the number of male and female customers who are blond or brunette.

			Total
Total			

11. In one month, she has 40 blond females and only 5 brunette males, a total of 100 customers and 20 male customers. Record these figures in your table and then complete the table.

Find the probability of the following events.

12. $P(Brunette \cap Female) =$ _____

13. $P(Male \cup Blond) =$ _____

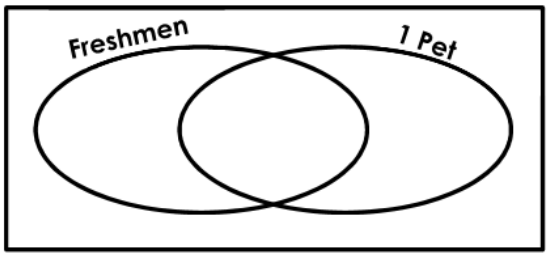
14. $P(Blond)' =$ _____

15. Probability of a male customer being blonde = _____

A survey was conducted with 150 students 50 from each grade level (Freshmen, Sophomores and Juniors) at Lucca High School. One question on the survey asked how many pets each student owned. The results are shown in the table below.

16. Complete the Venn Diagram based on the table.

# of Pets	Freshmen	Sophomores	Juniors
0	1	5	32
1	29	22	11
2	14	19	6
3	5	4	1
4	1	0	0



17. What is the probability of choosing a freshman who owns 1 pet from all students surveyed?

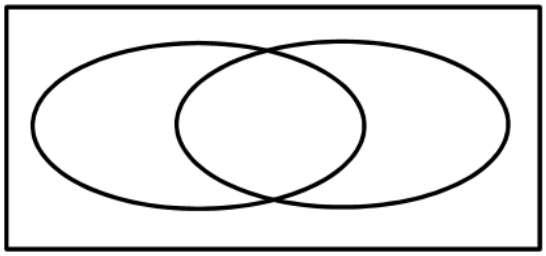
18. What is the probability of choosing a student who owns exactly two pets?

19. What is the most common number of pets owned by students?

20. Which class has the lowest probability of owning a pet?

21. Complete the table for the activities chosen by 74 teenagers on vacation. Then create a Venn Diagram to the right of the table so that it models the given information.

	Rock Climbing	Scuba Diving	**Totals**
Boys		5	
Girls	7	20	
Totals			

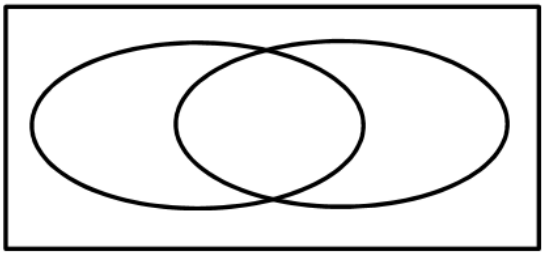


A gym has 138 members. 76 of these members are boys. There are 38 members who are girls and under 15 years old. There are 46 members who are boys and over 15 years old.

22. Complete the two-way table.

	Under 15	Over 15	**Total**
Boys		46	76
Girls	38		
Total			138

23. Create a Venn Diagram that models the table data.



Complete the two-way table to answer the questions.

In the year 2020, Cool High School graduated 250 students. Of the boys, 29 did not graduate; of the girls, 12 did not graduate.

24. Complete the two-way table

Students	Graduated	Not graduated	Total
Boys			
Girls			
Total			

25. What is the probability of a student being boy that graduated?

26. What is the probability of a student that is neither a graduate nor a girl?

27. What is the probability of student who graduated?

28. What is the probability of a student that did not graduate and is a girl.