Questions on 9.1 Ready, Set or 9.2 Set HW?

Mar 28-10:02 AM

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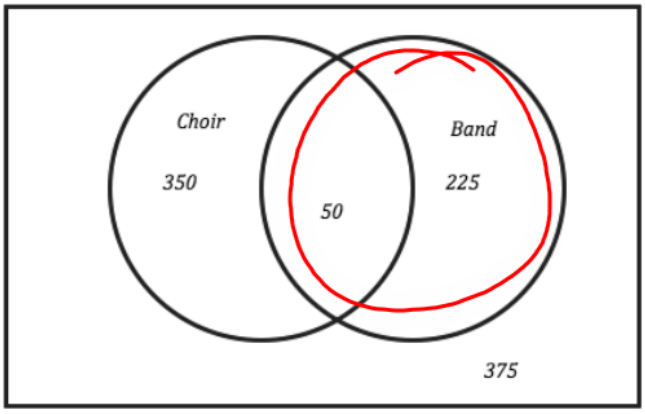
For each Venn Diagram provided answer the questions.

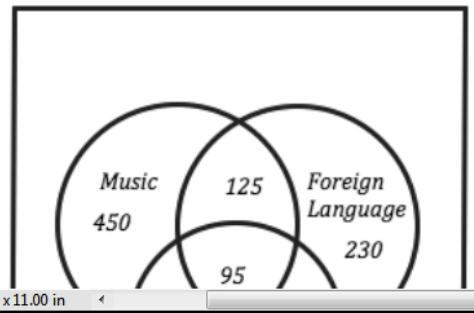


1. How many students were surveyed?
350+50+225+375=1000 students
2. What were the students asked?

3. How many students are in both choir and band?

4. How many students are not in either choir or band?

5. What is the probability that a randomly selected student would be in band?
P(band) = $\frac{225+50}{1000} = \frac{275}{1000} = \frac{27.5}{100}$ = 27.5%



This Venn Diagram represents enrollment in some of the elective courses.

6. What does the 95 in the center tell you?

7. What does the 145 tell you?

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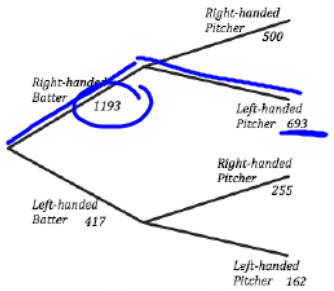
Given the tree diagram below answer the questions and determine the probabilities. The diagram represents the number of plate appearances during the first month of a minor league baseball season.



10. How many times did a batter come to the plate during this time period?

11. Based on this data, if you are a left-handed batter what is the probability that you will face a right-handed pitcher?

12. Based on this data, if you are a right-handed batter what is the probability that you will face a left-handed pitcher? $P(LHP \mid RHB) = \frac{693}{1193} = 0.58 = 58\%$

13. What is the probability that a left-handed pitcher will be throwing for any given plate appearance?

14. What is the probability that a left-handed batter would be at the plate for any given plate appearance?

15. What observations do you make about the data? Is there any amount that seems to be overly abundant? What might account for this?

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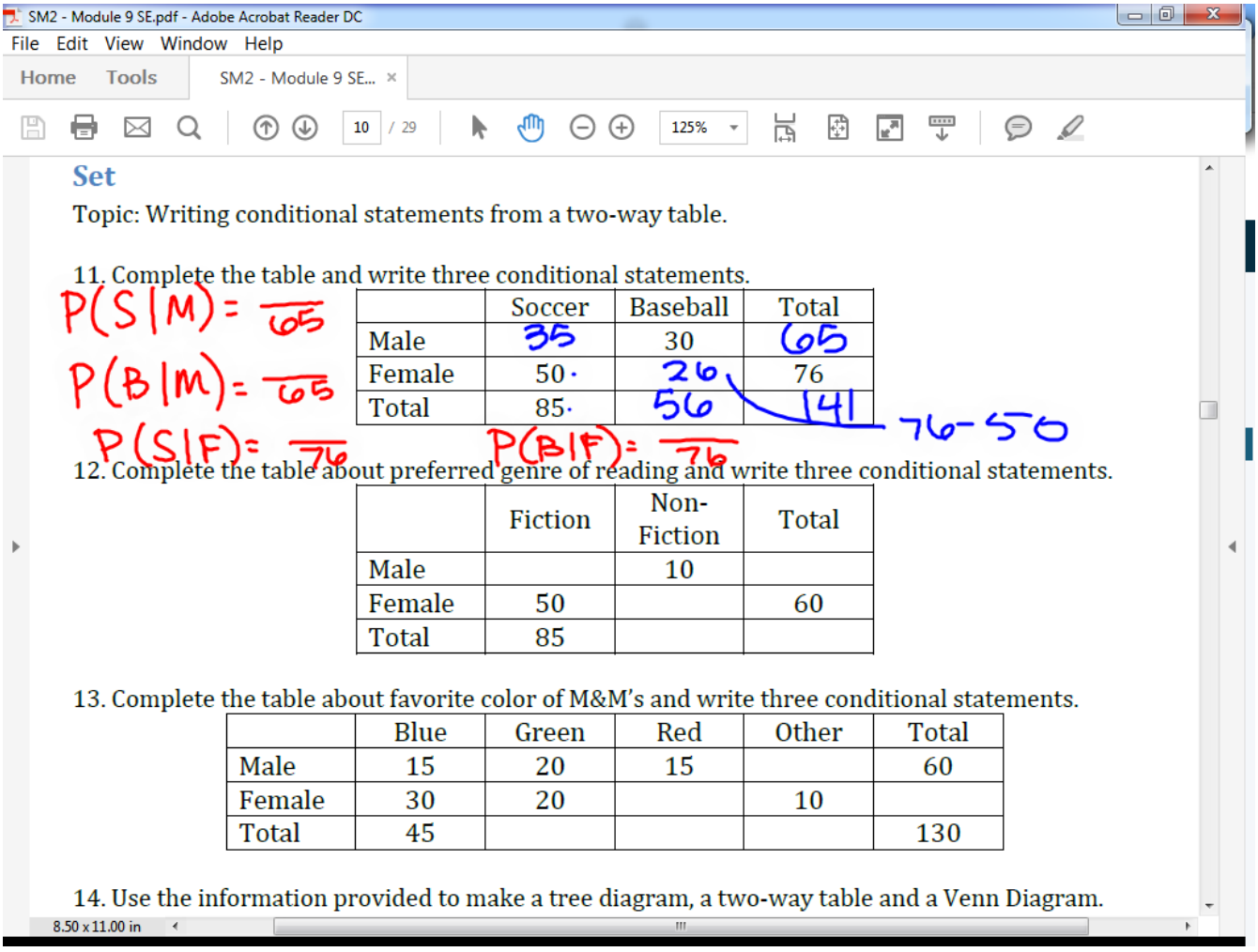


May 12-11:45 AM

9.3 Fried Freddy's

A Solidify Understanding Task

Danielle was surprised by the results of the survey to determine the 'favorite ice cream' between chocolate and vanilla (See task 9.2 *Chocolate vs. Vanilla*). The reason, she explains, is that she had asked several of her friends and the results were as follows:

	Chocolate	Vanilla	Total
Female	23	10	33
Male	6	8	14
Total	29	18	47

1. In this situation, chocolate is most preferred. How would you explain to her that this data may be less 'valid' compared to the data from the previous survey?

She didn't ask enough people, or an even # of males & females, and she just asked her friends.

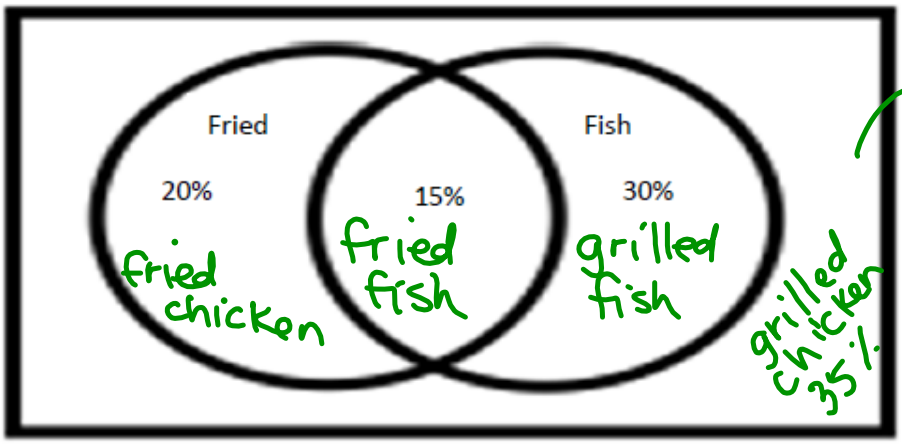
Using a sufficiently large number of trials helps us estimate the probability of an event happening. If the sample is large enough, we can say that we have an estimated probability outcome for the probability of an event happening. If the sample is not randomly selected (only asking your friends) or not large enough (collecting four data points is not enough information to estimate long run probabilities), then one should not estimate large scale probabilities. Sometimes, our sample increases in size over time. Below is an example of data that is collected over time, so the estimated probability outcome becomes more precise as the sample increases over time.

Freddy loves fried food. His passion for the perfect fried food recipes led to him opening the restaurant, "Fried Freddies." His two main dishes are focused around fish or chicken. Knowing he also had to open up his menu to people who prefer to have their food grilled instead of fried, he created the following menu board:

After being open for six months, Freddy realized he was having more food waste than he should because he was not predicting how much of each he should prepare in advance. His business friend, Tyrell, said he could help.

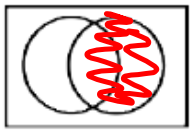
2. What information do you think Tyrell would need?
Food being ordered & when, what is being wasted,

Luckily, Freddy uses a computer to take orders each day so Tyrell had lots of data to pull from. After determining the average number of customers Freddy serves each day, Tyrell created the following Venn diagram to show Freddy the food preference of his customers:



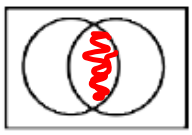
To make sense of the diagram, Freddy computed the following probability statements:

3. What is the probability that a randomly selected customer would order fish?
P(fish) = 30+15=45%.
Shade the part of the diagram that models this solution.

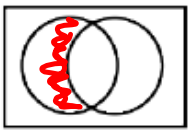


∩ intersection "and"

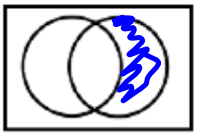
4. What is the probability that a randomly selected customer would order fried fish?
P(fried ∩ fish) = P(fried and fish) = 15%.
Shade the part of the diagram that models this solution.



5. What is the probability that a person prefers fried chicken?
P(fried∩chicken) = P(fried and chicken) = 20%.
Shade the part of the diagram that models this solution.



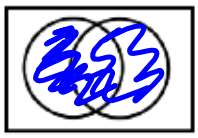
6. What is the estimated probability that a randomly selected customer would want their fish grilled?
P(grilled and fish) = P(grilled n fish) = 30%.
Shade the part of the diagram that models this solution.



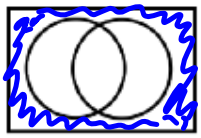
7. If Freddy serves 100 meals at lunch on a particular day, how many orders of fish should he prepare with his famous fried recipe?
15% of 100 = 0.15(100) = $\frac{15}{100}(100)$ = 15 meals

U union "or"

8. What is the probability that a randomly selected person would choose fish or fried?
P(friedUfish) = P(fried or fish) = 20 + 15 + 30 = 65 %.
Shade the part of the diagram that models this solution.

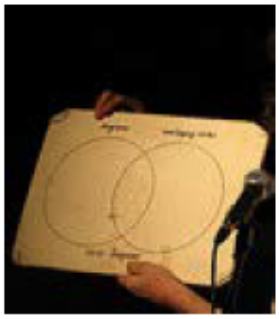


9. What is the probability that a randomly selected person would NOT choose fish or fried?
100 - 65 = 35%.
Shade the part of the diagram that models this solution.



9.4 Visualizing with Venn

A Solidify Understanding Task



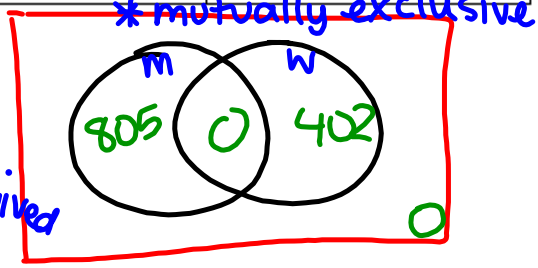
One of the attributes of Venn diagram's is that it can be easy to see the relationships within the data. In this task, we will create multiple Venn diagrams using data and determine the events that create diagrams to either have an intersection or for them to be mutually exclusive.

1. The following data represents the number of men and women passengers aboard the titanic and whether or not they survived.

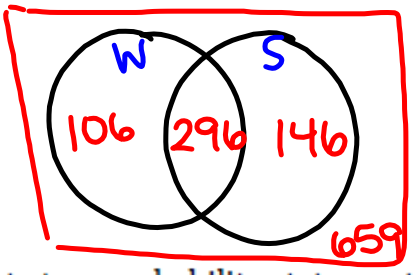
	Survived	Did not survive	Total
Men	146	659	805
Women	296	106	402
Total	442	765	1207

2. Create three Venn diagrams with this data.
   a. Men vs Women
   b. Women vs Survived
   c. You choose the conditions men vs. not survived

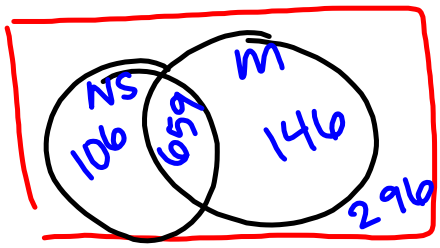
a)



b)



c)



3. Create two probability statements using each of your Venn diagrams from question 2.

$P(S|W) = \frac{296}{402}$

$P(NS|W) = \frac{106}{402}$

$P(S|M) = \frac{146}{805}$

$P(NS|M) = \frac{659}{805}$

May 19-8:56 AM

4. Create and label three different Venn diagrams using this data. Create at least one that is mutually exclusive and at least one that has an intersection.

Sample size: 100

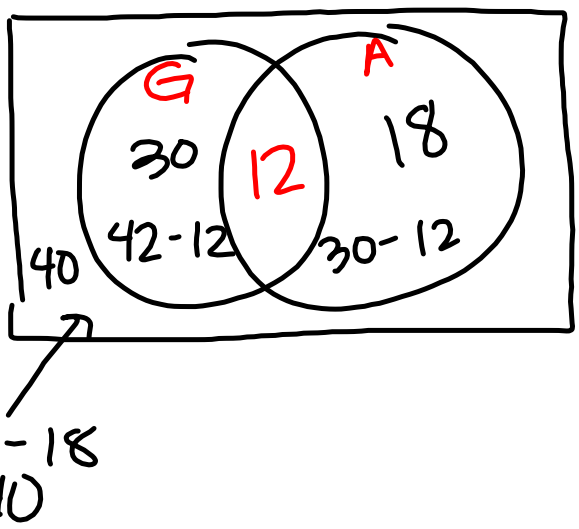
$P(\text{girl}) = \frac{42}{100}$ P(G) P(A) P(A|G)

$P(\text{girl or art}) = (\frac{42}{100} + \frac{30}{100}) - \frac{12}{100}$

$P(\text{art}) = \frac{30}{100}$

P(not art) = 70/100

P(boy) = $\frac{58}{100}$



5. Describe the conditions that create mutually exclusive Venn diagrams and those that create intersections.

6. What conjecture can you make regarding the best way to create a Venn diagram from data to highlight probabilities?

Homework

9.3 Set (pgs.15-16)

&

9.4 Set (pgs.19-21)

Mar 28-9:36 AM