

SECONDARY MATH II // MODULE 9  
 PROBABILITY-9.1



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## 9.4 Visualizing with Venn

### A Solidify Understanding Task

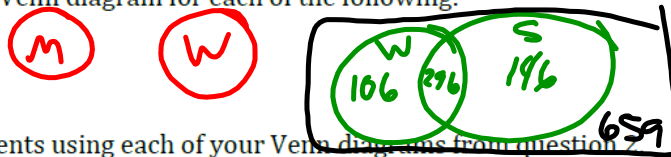
One of the attributes of Venn diagram's is that it can be easy to see the relationships within the data. In this task, we will create multiple Venn diagrams using data and determine the events that create diagrams to either have an intersection or for them to be mutually exclusive.

- The following data represents the number of men and women passengers aboard the Titanic and whether or not they survived. Fill in the blanks for this table:

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

- Using the data above, create a Venn diagram for each of the following:

- Men vs Women
- Women vs Survived
- You choose the conditions



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

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

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

Sample size: 100

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

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

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

$$P(\text{not art}) =$$

$$P(\text{boy}) =$$

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

→ no overlap, separate

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

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9.4

READY, SET, GO!

Name

Period

Date

**READY**

Topic: Products of probabilities, multiplying and dividing fractions  
**Find the products or quotients below.**

1.  $\frac{1}{2} \cdot \frac{2}{3}$

2.  $\frac{3}{5} \cdot \frac{1}{3}$

3.  $\frac{7}{10} \cdot \frac{2}{5}$

4.  $\frac{8}{7} \cdot \frac{3}{4}$

5.  $\frac{1}{3} \cdot \frac{2}{1} \cdot \frac{2}{3}$

6.  $\frac{2}{5} \div \frac{2}{3}$

7.  $P(A) = \frac{3}{4}$      $P(B) = \frac{1}{2}$

8.  $P(A) = \frac{1}{6}$      $P(B) = \frac{1}{3}$

$P(A) * P(B) =$

$P(A) * P(B) =$

**SET**

Topic: Connecting representations of events for probability

For each situation, one of the representations (two-way table, Venn diagram, tree diagram, context or probability notation) is provided. Use the provided information to complete the remaining representations.

9. Are you Blue?

Notation		2-way Table			
Key: Male = M Blue = B	Female = F Not Blue = N		Blue	Not Blue	Total
Sample size = 200		Male	36	28	64
$P(B) = \frac{84}{200}$	$P(M) = \frac{64}{200}$	Female	48	88	136
$P(F B) = \frac{48}{84}$	$P(B F) = \frac{48}{136}$	Total	84	116	200
$P(M \cap B) = \frac{36}{200}$	$P(M \cup B) = \frac{36+28+48}{200} = \frac{112}{200}$				

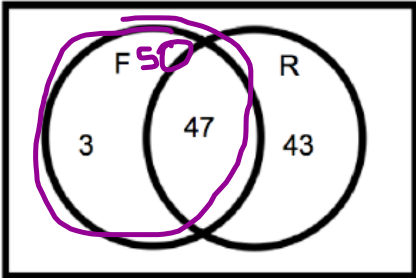
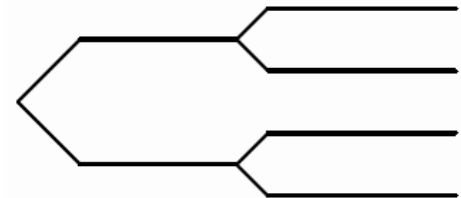
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Venn Diagram	Tree Diagram

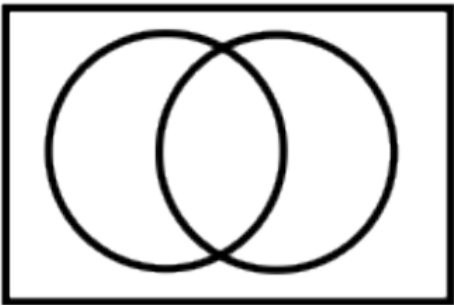
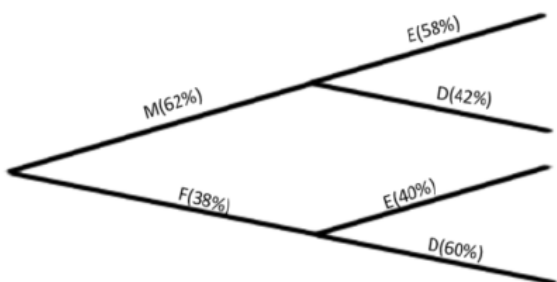
Write three observations you can make about this data.

more males stated that they are blue, than women.

10. Right and left handedness of a group.

Notation	2-way Table																
<p>Key:                      Male = M                  Female = F                      Lefty = L                  Righty = R</p> <p>Sample size = 100 people</p> <p><math>P(L) =</math>                  <math>P(M) =</math>  <math>P(F) =</math>                  <math>P(L F) = 3/50</math>  <math>P(L M) =</math></p>	<table border="1" data-bbox="882 763 1441 992"> <thead> <tr> <th></th> <th>Lefty</th> <th>Righty</th> <th>Total</th> </tr> </thead> <tbody> <tr> <th>Male</th> <td></td> <td></td> <td></td> </tr> <tr> <th>Female</th> <td></td> <td></td> <td></td> </tr> <tr> <th>Total</th> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Lefty	Righty	Total	Male				Female				Total			
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Male																	
Female																	
Total																	
Venn Diagram	Tree Diagram																
																	
<p>Write three conditional statements regarding this data.</p>																	

11. The most important meal of the day.

Notation	2-way Table																
<p>Key:                      Male = M                  Female = F                      Eats Breakfast = E    Doesn't Eat Breakfast = D</p> <p>Sample size =                      P(E) =                  P(E M) =</p> <p>P(E ∩ M) =              P(E F) =</p> <p>P(E ∩ F) =</p>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 20%;">Eats</th> <th style="width: 20%;">Doesn't</th> <th style="width: 45%;">Total</th> </tr> </thead> <tbody> <tr> <td>Male</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Female</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td></td> <td></td> <td>685</td> </tr> </tbody> </table>		Eats	Doesn't	Total	Male				Female				Total			685
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Venn Diagram	Tree Diagram																
																	
<p>Does this data surprise you? Why or why not.</p>																	

**GO**

Topic: Writing conditional statements from two-way tables

12. Complete the table and write three conditional statements.

	Biking	Swimming	Total
Male		50	
Female	35		76
Total	85		

13. Complete the table about preferred genre of reading and write three conditional statements.

	Ice Cream	Cake	Total
Male		20	
Female	10		60
Total	85		

14. Complete the table about eye color and write three conditional statements.

	Blue	Green	Brown	Other	Total
Male	55	20	15		100
Female		20		10	
Total			75		230