May 16-7:43 AM

Learning Targets

- I can calculate conditional probabilities.
- I can construct a two-way table.
- I can find probabilities using a two-way table.

Sep 16-9:16 PM

Conditional Probability

For any two events A and B, the conditional probability between them is P(A|B). This is read: "The probability of event A given that event B has already occurred."

$P(A|B)$

$P(A/B)$

Sep 23-10:42 PM

Ex. Use the two way (contingency) table at the right to find the following probabilities.

Class	Male	Female	
Freshmen	20	37	57
Sophomore	42	12	54
Junior	35	34	69
Senior	22	17	39
	119	100	219 Total

a) P(Freshmen) $\frac{57}{219} = \frac{19}{73}$

b) P(Sophomore or Female) $\frac{142}{219}$

c) P(Junior and Male) $\frac{35}{219}$

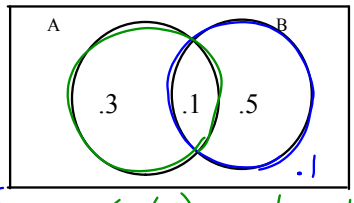
d) P(sophomore I male) $\frac{42}{119}$

e) P(senior I female) $\frac{17}{100}$

f) P(sophomore I senior) 0

Sep 23-10:47 PM

Ex. Use the Venn diagram at the right to find the following probabilities.



a) P(B) .6

b) P(A ∩ B) .1

c) P(A I B) $\frac{.1}{.6} = \frac{1}{6}$

d) P(~B) .4

$P(B/A) = \frac{.1}{.4} = \frac{1}{4}$

$P(A/A \cup B) = \frac{.4}{.9} = \frac{4}{9}$

Sep 23-10:51 PM

Here is the data from the sinking of the Titanic:

	1st class	2nd class	3rd class	Crew	
Survived	200	117	172	215	704
Died	119	152	527	703	1501
	319	269	699	918	2205 Total

1. What is the probability of randomly selecting a person on the Titanic who survived?

$\frac{704}{2205} = 31.9\%$

2. What is the probability of randomly selecting a person on the Titanic who was in 3rd class?

$\frac{699}{2205}$ 32% (31.7%)

3. What is the probability of randomly selecting a person on the Titanic who was in the 3rd class given that they survived?

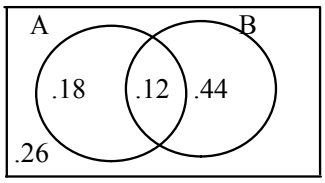
$172/704 = 24.4\%$

4. What is the probability of randomly selecting a person on the Titanic who survived given they are in 3rd class?

$172/699$ 24.6%

Sep 23-10:54 PM

Use the Venn Diagram to find the probabilities.



1. P(A) = .3
2. P(~A) = .7
3. P(B) = 56%
4. P(~B) = 44%
5. P(B|A) = $\frac{.12}{.30} = \frac{2}{5}$
6. P(~B|A) = $\frac{.18}{.30} = \frac{3}{5}$
7. P(A|B) = $\frac{.12}{.56} = .21$
8. P(~A|B) = $\frac{.44}{.56} = \frac{11}{14}$
9. P(A|A∪B) = $\frac{.3}{.74}$ 41%
10. P(A ∩ B) = 12%
11. P(A∪B) = .74

Sep 23-11:02 PM

Homework:
p. 50 #1, 3, 4, 7-9, 11, 14, 16

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