Module 7 HW is due today, get it out and ready to be checked off...

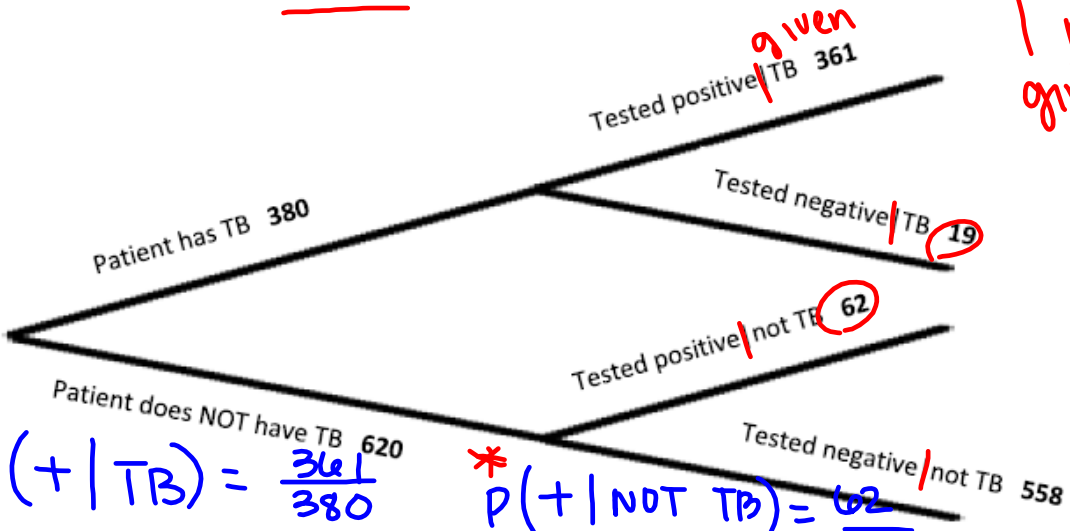
Mar 28-10:02 AM

9.1 TB or Not TB?

A Develop Understanding Task

Tuberculosis (TB) can be tested in a variety of ways, including a skin test. If a person has turberculosis antibodies, then they are considered to have TB. Below is a tree diagram representing data based on 1,000 people who have been given a skin test for turberculosis.

| means given



given

* $P(+ \mid TB) = \frac{361}{380}$
* $P(- \mid TB) = \frac{19}{380}$
* $P(+ \mid NOT\ TB) = \frac{62}{620}$
* $P(- \mid NOT\ TB) = \frac{558}{620}$

1. Use your knowledge to write several probability statements about this test (based on the numbers provided).

$P(\text{not TB}) = \frac{620}{1000} = \frac{62}{100} = \frac{31}{50} = 62\%$

$P(TB) = \frac{380}{1000} = \frac{38}{100} = \frac{19}{50} = 38\%$

$P(\text{misdiagnosis}) = \frac{81}{1000} = .081 = 8.1\%$

$P(\text{correct diagnosis}) = 100\% - 8.1\% = 91.9\%$

2. Look over the statements you wrote. Put an asterisk (*) next to those that are conditional probability statements (statements based on margin "row" or "column" percentages). If there are not any, add some now.

3. Part of understanding the world around us is being able to take information, make sense of it, and then explain it to others. Based on your statements above, what would you say to a friend regarding the validity of their results if they are testing for TB and only get a skin test? Be sure to use data to best inform your friend.

Other questions to consider....

4. In this situation, explain the consequences of errors (having a test with incorrect results).

5. If a health test is not 100% certain, why might it be beneficial to have the results lean more toward a false positive?

SKIP

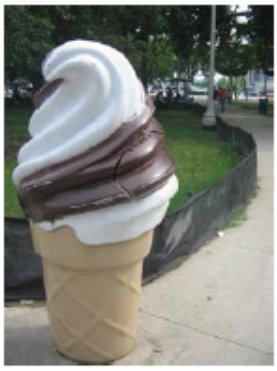
6. Is a sample space of 200 enough to indicate whether or not this is true for an entire population?

7. How would you answer the young adult who tested positive and asks, "Do I really have TB?"

May 11-8:52 AM

9.2 Chocolate versus Vanilla

A Solidify Understanding Task



Danielle loves chocolate ice cream much more than vanilla and was explaining to her best friend Raquel that so does most of the world. Raquel disagreed and thought vanilla is much better. To settle the argument, they created an online survey asking people to choose their favorite ice cream flavor between chocolate and vanilla. After completing the survey, the following results came back:

- There were 8,756 females and 6,010 males who responded.
- Out of all the males, 59.7% chose vanilla over chocolate.
- 4,732 females chose chocolate.

1. Upon first observations, which flavor do you think "won"? _____. Write a sentence describing what you see at 'first glance' that makes you think this.

2. Raquel started to organize the data in the following two-way table. See if you can help complete this (using counts and not percentages):

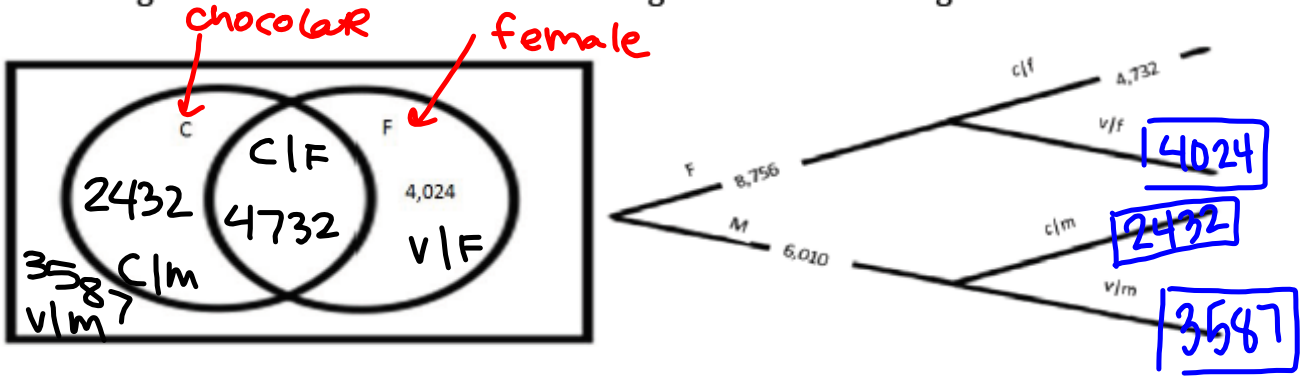
8756-4732

	Chocolate	Vanilla	Total
Female	4732	4024	8,756
Male	2423	3587	6,010
Total	7155	7611	14766

0.597(6010) = 3587.97 = 3587

6010-3587

3. Organize the same data in a Venn diagram and a tree diagram.



4. Using your organized data representations, write probabilities that help support your claim regarding the preferred flavor of ice cream. For each probability, write a complete statement as well as the corresponding probability notation.

$P(\text{vanilla}) = \frac{7611}{14766} = 51.54\%$

$P(\text{chocolate}) = \frac{7154}{14766} = 48.46\%$

$P(c|f) = \frac{4732}{8756} = 54.1\%$

$P(v|f) = \frac{4024}{8756} = 45.9\%$

$P(c|m) = \frac{2423}{6010} = 40.3\%$

$P(v|m) = \frac{3587}{6010} = 59.7\%$

5. Looking over the three representations (tree diagram, two-way table, and Venn diagram), what probabilities seem to be easier to see in each? What probabilities are hidden or hard to see?

Highlighted (easier to see)	Hidden
Tree diagram	Tree diagram
Two-way table	Two-way table
Venn diagram	Venn diagram

6. Getting back to ice cream. Do you think this is enough information to proclaim the statement that one ice cream is favored over another? Explain.

Homework

9.1 Ready, Set (pgs.5-6)

&

9.2 Set (pg.10)

Mar 28-10:02 AM

May 8-12:32 PM