

6/06/20

Agenda for Math 5710 ♪ Meeting #15 ☺ 7/13/20 (8:00 a.m. – 9:10 a.m.)

1. Hello:

Brigham City: Adam Blakeslee Ryan Johnson Tyson Mortensen

Logan: David Allen Natalie Anderson Kameron Baird Stephen Brezinski
 Zachary Ellis Adam Flanders Brock Francom Xiang Gao
 Ryan Goodman Janette Goodridge Hadley Hamar Phillip Leifer
 Brittney Miller Jonathan Mousley Erika Mueller Shelby Simpson
 Steven Summers Matthew White Zhang Xiaomeng

2. Note the syllabus' activity list for today:

15: M/7/13	1. Construct the concept of conditional probability, comprehend associated communication structures, and employ associated algorithms. 2. Discover and comprehend Bayes' Theorem. 3. Take advantage of Quiz 15.
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3. Briefly, raise and address issues and questions stimulated by the following homework assignment:

- A. Study our notes from Meeting #14.
- B. Comprehend Jim's sample response to Quiz 14.
- C*. Express (in simplified form) the coefficient of x^2y^3 in the expansion of $(2x + 3y)^5$. Please display the computations in a pdf document uploaded to the appropriate Canvas assignment link.
- D*. Express (in simplified form) the following; display the computations in a pdf document uploaded to the appropriate Canvas assignment link:

$$\binom{n}{0} + \binom{n}{1} + \binom{n}{2} + \binom{n}{3} + \dots + \binom{n}{n}$$

- E. From the Video Page of *Canvas*, view with comprehension "binomial theorem."
- F. Comprehend Jim's sample responses to the homework prompts that are posted on *Canvas*.

4. Wrap our brains around and deep inside of the concept of *conditional probability*:

A. Address Shaneal's problem:

Shaneal is the director of student advisement for Rainbow University's College of Engineering. As part of an action research study, she is examining interactions among freshpersons' success with two courses (Calculus I and Graph Theory I) that they all take during their first semester at Rainbow. Her records show that over the previous four semesters 70% of the students passed calculus, 55% passed graph theory, and 45% passed both courses. Using a randomly selected sample of students grade records, she wants to compute the random probability that a student who passed calculus also passed graph theory.

B. Note that Given $A \subseteq \Omega \wedge B \subseteq \Omega \ni p(B) \neq 0$, " $p(A|B)$ " is read "the conditional probability of A given that B ."

C. Given $A \subseteq \Omega \wedge B \subseteq \Omega \ni p(B) \neq 0$, formulate a definition for $(p(A|B))$:

D. Meet at convenient companion to our definition of *conditional probability*:

Bayes' Theorem:

$$\text{Given } A \subseteq \Omega \wedge B \subseteq \Omega \ni p(B) \neq 0, (p(B|A) = \frac{p(A|B)p(B)}{p(A)})$$

1702– 1761



E. Understand why Bayes' theorem is convenient.

7. Take advantage of Quiz 15.
8. Complete the following assignment prior to Meeting #16:
 - A. Study our notes from Meeting #15.
 - B. Comprehend Jim's sample response to Quiz 15.
 - C. Comprehend Entry #036A–D of our *Glossary*.
 - D*. Please solve each of the following problems; display the computations, and upload the resulting pdf document on the appropriate Canvas assignment link:
 - i In a certain region of western Asia, 75 % of the population live to be at least 80 years old. 63% of the population lives to be at least 90 years. What is the probability of a randomly selected person who is in her/his/their 80's survives to be 90 years old?
 - ii. Assume that in a two-child family, all sex distributions are equally probable. An experiment is conducted in which a *family* is randomly selected from { families that have exactly two children }; the selected family has at least one girl. What is the probability that the second child is also a girl?
 - iii. Assume that in a two-child family, all sex distributions are equally probable. An experiment is conducted in which a *child* is randomly selected from { families that have exactly two children } and that particular child is a girl. What is the probability that the second child is also a girl?
 - E. From the Video Page of *Canvas*, view with comprehension “Bayes’ theorem of conditional probability.”
 - F. Comprehend Jim’s sample responses to the homework prompts that are posted on *Canvas*.
9. And from Ilyas Kassam ():

If nature has taught us anything it is the impossible is probable.

