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A02052161

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*.

i) A = person = 90 years $P(A|B) = ?$
B = person = 80 years

$P(A) = .75$
$P(B) = .63$
$P(A \cap B) = P(A) = .75$

$P(A|B) = \frac{.75}{.63} = .84$

ii) A = family has 2 girls S = sample space
B = family has at least 1 girl $S = \{(g,g), (g,b), (b,g), (b,b)\}$

$P(A) = .25$
$P(B) = .75$
$P(A \cap B) = .25$

$P(A|B) = \frac{.25}{.75} = \frac{1}{3}$

iii) A = child is a girl $P(B|A) = ?$
B = sibling also girl

$P(A) = \frac{4}{8} = .5$
$P(B) = .25$ $P(A \cap B) = .25 = P(B \cap A)$

$P(B|A) = \frac{P(B \cap A)}{P(A)} = \frac{.25}{.5} = \frac{1}{2}$