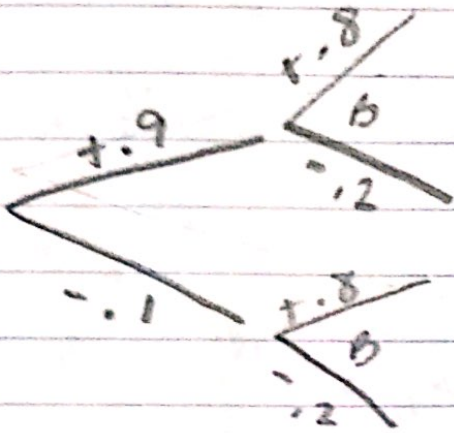


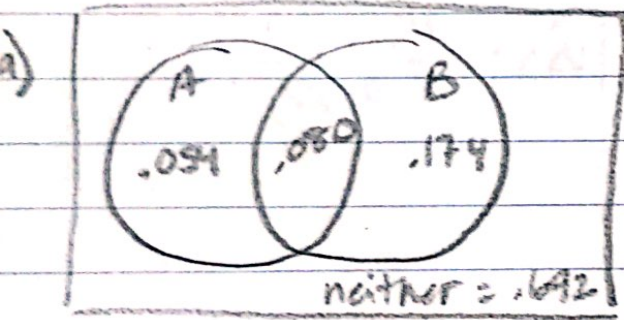
Key

## Statistics: More Probability Worksheet

1. Consolidated Builders has bid on two large construction projects. The company president believes that the probability of winning the first contract (event A) is 0.6, that the probability of winning the second (event B) is 0.5, and that the probability of winning both jobs (A and B) is 0.3. What is the probability that Consolidated will win at least one of the jobs (A or B)?
2. An athlete suspected of having used steroids is given two tests that operate independently of each other. Test A has probability 0.9 of being positive if steroids have been used. Test B has probability 0.8 of being positive if steroids have been used. Suppose the athlete has indeed used steroids. What is the probability that he tests positive if both tests are used?
3. We will call a household prosperous if its income exceeds \$100,000. We will call the household educated if the householder has completed college. Select an American household at random and let A be the event that the selected household is prosperous and B the event that it is educated. According to the Census Bureau,  $P(A) = 0.134$ ,  $P(B) = 0.254$ , and the joint probability that household is both prosperous and educated is  $P(A \text{ and } B) = 0.080$ .
  - a) Draw a Venn diagram to illustrate the situation.
  - b) What is the probability of  $P(A \text{ or } B)$ , that the household selected is either prosperous or educated?
  - c) What is the probability that the household is prosperous but not educated?
  - d) What is the probability that the household is neither prosperous nor educated?



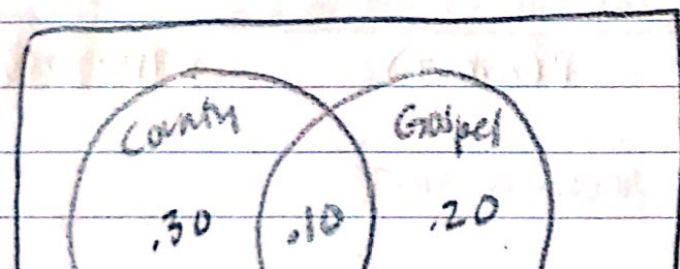
$$(.9)(.8) = .72 \quad 72\%$$



b)  $P(A \cup B) = .134 + .254 - .080 = .308$

c) .054

d) .692



b) .30

c) .40

d)  $P(\text{Gospel} | \text{County}) =$

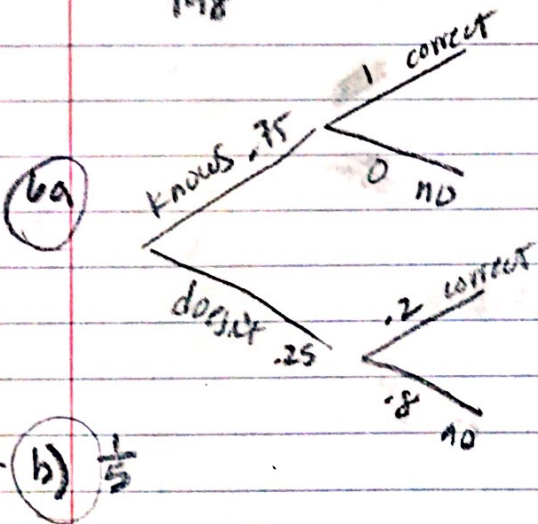
$$c) P(\text{Gospel} | \text{no country}) = \frac{P(\text{Gospel} \cap \text{No country})}{P(\text{no country})} = \frac{.20}{.60} = \frac{.3333}{.60} \quad d)$$

$$5 a) \frac{110}{445} = .24719$$

$$b) \frac{198}{445} = .44494$$

$$c) \frac{82}{144} = .56944 \quad P(\text{US} | \text{Physiology}) = \frac{P(\text{US} \cap \text{Physiology})}{P(\text{Physiology})}$$

$$d) \frac{82}{198} = .414141 \quad P(\text{Phys} | \text{US}) = \frac{P(\text{Phys} \cap \text{US})}{P(\text{US})}$$



$$c) P(\text{know it} | \text{correct}) = \frac{P(\text{correct} \cap \text{know})}{P(\text{correct})} = \frac{.75}{(.75 + (.25)(.2))} = \frac{.75}{.80} = .9375$$

you are given that the problem is correct -

probability she knew if given that the answer is correct.

$$b) (.4)(.5) + (.4)(.9) + (.5)(.2) = .58$$

$$c) P(\text{Hispanic} | \text{votes yes}) = \frac{P(\text{Hispanic} \cap \text{yes})}{P(\text{Hispanic})} = \frac{.10}{.20} = .5$$