

Math 206 - Quiz 3

February 10, 2010

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (2 points) A letter is selected at random from the following box:

R A C E C A R S

A possible sample space for this experiment is $\{A, C, E, R, S\}$.

- (a) What are some advantages and/or disadvantages of using this particular sample space?

DISADVANTAGES: IT IS NOT A UNIFORM SAMPLE SPACE

ADVANTAGES: BECAUSE IT FOCUSES ONLY ON THE DIFFERENT LETTERS, IT IS VERY CONVENIENT TO USE.

- (b) What is the probability of selecting a letter from the first half of the alphabet?

$$\frac{\text{FAVORABLE LETTERS}}{\text{TOTAL LETTERS}} = \frac{5}{8}$$

2. (1 point) Suppose that $P(B) = 0.36$, $P(A \cup B) = 0.84$, and $P(\bar{A}) = 0.28$. Find $P(A \cap B)$.

$$P(\bar{A}) = 0.28 \Rightarrow P(A) = 1 - 0.28 = 0.72$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$0.84 = 0.72 + 0.36 - P(A \cap B)$$

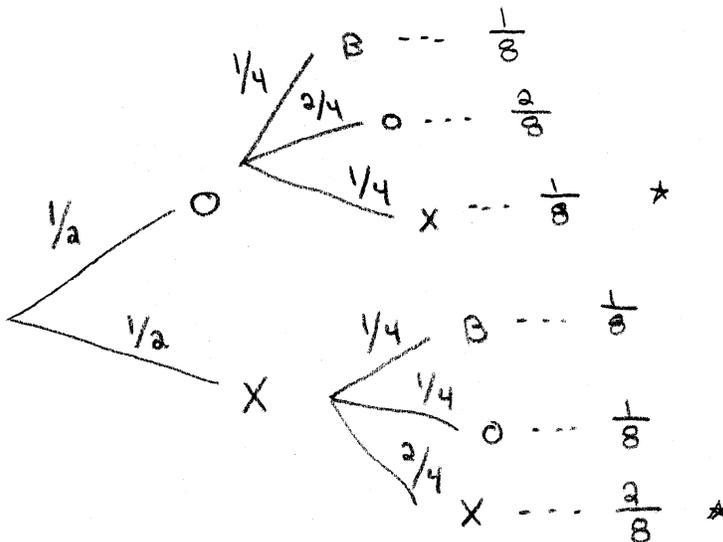
$$P(A \cap B) = 1.08 - 0.84 = 0.24$$

3. (2 points) A letter is drawn from the first box and placed into the second box. Then a letter is drawn from the second box.

O X

B O X

Sketch the tree diagram that models this experiment and find the probability that an X is selected from the second box.



PROB OF X FROM
BOX 2

$$= \frac{1}{8} + \frac{2}{8} = \frac{3}{8}$$