

Math 206 - Quiz 3

February 4, 2015

Name key

Score _____

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

1. (1 point) A jar contains 3 quarters and 5 pennies. Joe would like to add pennies to the jar in order to make the probability of randomly selecting a quarter be less than 5%. What is the minimum number of pennies he must add?

LET x = NUMBER OF PENNIES ADDED

$$\frac{3}{8+x} < 0.05$$

$$\Rightarrow 3 < 0.05(8+x)$$

$$3 < 0.4 + 0.05x$$

$$2.6 < 0.05x$$

$$52 < x$$

HE MUST ADD MORE THAN 52 PENNIES.

ADD AT LEAST
53 PENNIES

2. (1 point) Suppose that A and B are events with $P(A) = 0.48$, $P(\bar{B}) = 0.63$, and $P(A \cup B) = 0.65$. Compute $P(A \cap B)$.

$$P(B) = 0.37$$

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

$$0.65 = 0.48 + 0.37 - P(A \cap B)$$

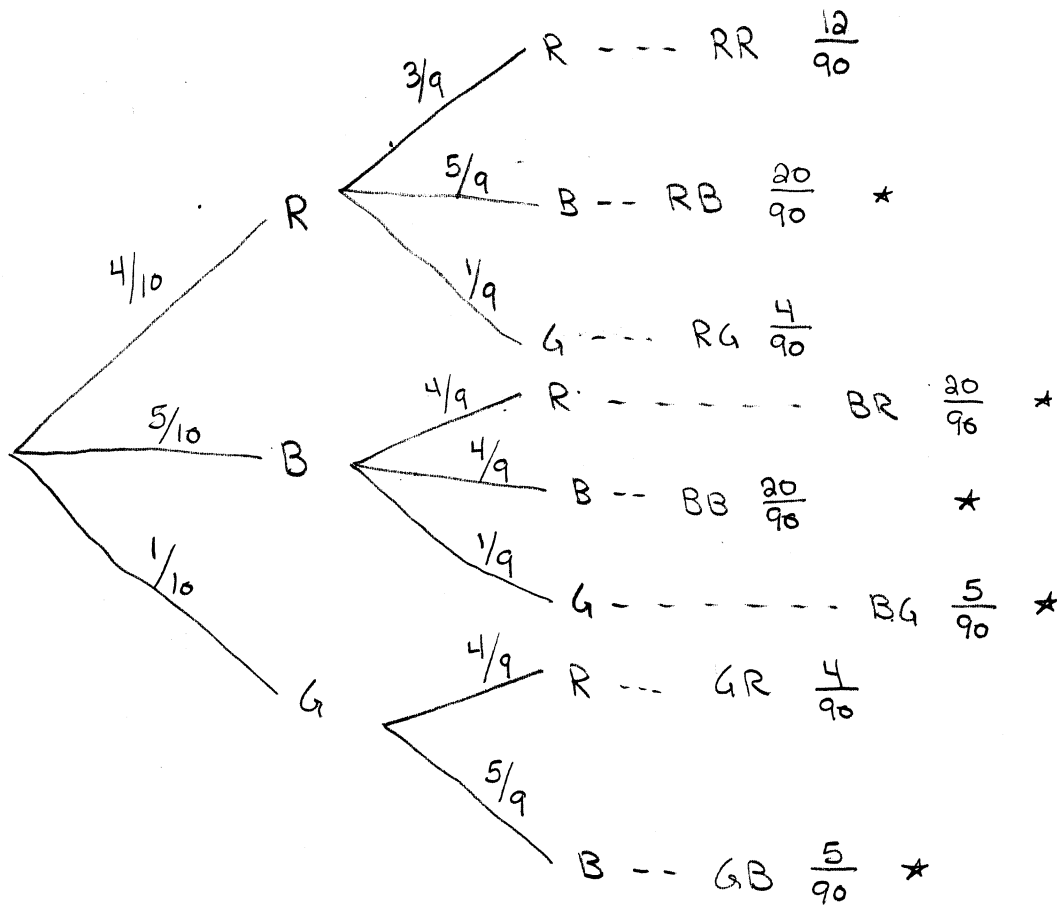
$$0.65 = 0.85 - P(A \cap B)$$



$$P(A \cap B) = 0.20$$

3. (3 points) A jar contains 4 red marbles, 5 blue marbles, and 1 green marble. Two marbles are selected at random without replacement.

(a) Sketch a complete probability tree for this experiment. Include the probabilities of the paths.



(b) What is the probability of selecting at least one blue marble?

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$$\frac{20}{90} + \frac{20}{90} + \frac{20}{90} + \frac{5}{90} + \frac{5}{90} = \boxed{\frac{70}{90}}$$