

I. Let A and B be events in a sample space S and P be a probability function on S . Suppose that $P(A) = .37$, $P(B) = .65$, and $P(A \cup B) = .88$. Please find the indicated probabilities below. You must show at least one intermediate step to receive full credit. (8 points total)

(a) $P(B^C)$

(b) $P(A \cap B)$

(c) $P(A^C \cap B)$

(d) $P(A^C \cap B^C)$

(e) The probability that event A or event B but not both events occurs.

II. A bag of Halloween candy contains 25 miniature Snicker bars, 35 miniature Reeses Cups, and 10 Tootsie Rolls. A trick-or-treater reaches into the bag and pulls out 6 pieces of candy. Please answer the following (you may leave your answers in combinatorial form). (6 points total)

(a) What is the probability the trick-or-treater will get 3 Snicker bars?

(b) What is the probability the trick-or-treater will get two of each candy type?

III. A fair coin is tossed eight times and the outcomes are recorded. Please answer the following (you may leave your answers in combinatorial form). (6 points total)

(a) What is the probability that three of the eight flips will be heads?

(b) What is the probability that there will be at least one head in the eight flips (Hint: Think complement!)?