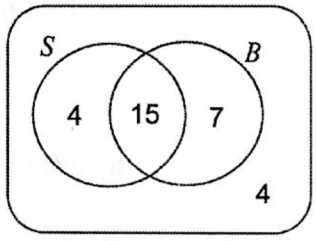
Analysis H 2023-2024
Hahn / Hlasek / Tantod
Unit 2 (Probability) Quiz 2
NO CALCULATORS

_____
27 pts

Name: _____
will probably do well on this quiz
Date: _____ Period: _____




**For Problems 1 and 2:** The Venn Diagram on the right shows responses to the following survey question: "Do you eat pancakes with syrup or bacon?" $S$ represents syrup and $B$ represents bacon. The survey had 30 respondents.

1. Which of the following probabilities are equal to $\frac{1}{2}$?
   Circle **all** the apply. *(3 pts total)*

   a) $P(S \cap B)$ b) $P(S \cup B)$ c) $P(S' \cap B)$

   d) $P(S' \cup B')$ e) $P(B \mid S')$ f) $P(S \mid B')$

2. Answer true or false for each statement below. *(1 pt each)*

   a) $S$ and $B$ are mutually exclusive. _____

   b) $S$ and $B$ are independent. _____

3. I draw a hand of 4 cards from a standard deck of 52 cards. What is the probability that I have 2 Queens, given that I have exactly 2 Aces? Leave your answer in factorial, exponent, and/or choose number form. *(3pts)*

4. A pack of Starburst contains 12 pieces of chewy candy: 2 yellow, 4 pink, and 6 red. Firstly, you choose one candy at random and eat it. Then, you choose 2nd candy at random and eat it. Find the following probabilities as completely simplified fractions. *(2pts each)*

   a) P(both pieces of candy are yellow)

   b) P(2nd candy is pink)

   c) P(1st candy is pink | 2nd candy is pink)

5. A (blindfolded) marksman hits the target 3 times out of 5 times. If he fires 4 shots, find the following probabilities. Leave your answers in factorial, exponent, and/or choose number form. *(2 pts each)*

   a) P(more than 2 hits)

   b) P(at least 3 misses)

6. A fair coin is tossed n times, where n is a positive integer. The probability that a head occurred 10 times is the same as the probability that a head occurred 8 times. Find the value of n. Your answer should be a single integer. *(3 pts)*

7. Gunn Casino offers a game where two fair 6-sided dice are rolled and the numbers that were rolled are multiplied. If the product is even, you receive $2. If the product is one, you receive $9. It costs $1.50 to play this game. What is the expected value of playing this game? Explain why you would or would not play. *(3 pts)*

8. A spinner wheel with integers from 1 to n is spun once. If each number is equally likely to be the outcome, find the expected value in terms of n. Show the work that leads to your answer. *(3 pts)*