

MATH 3160 - Probability - Fall 2017
Quiz 2, Wednesday September 13

Show all work. You should either write at least a sentence explaining your reasoning, OR annotate your math work with brief explanations. Correct answer with no solution will give only a partial credit. You may leave your answer in terms of sums, products, factorials or binomial coefficients, and fractions. There is NO need to simplify. NO calculators are needed.

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(1) Suppose that A and B are events for which $\mathbb{P}(A) = 0.4$, $\mathbb{P}(B) = 0.3$ and $\mathbb{P}(A \cap B) = 0.2$. What is the probability that B occurs but A does not?

Answer: **.1**

(2) In the same situation, what is the probability that neither A nor B occurs?

Answer: **.5**

(3) A pair of fair dice is rolled. What is the probability that the dice are not equal?

Answer: **5/6**

(4) A pair of fair dice is rolled. What is the probability that at least one die is odd?

Answer: **3/4**

(5) On a fictional planet, the year is 300 days long. Every day there maybe rain, or snow, or both, or neither. In a given year, there are 150 days of rain, 100 days of snow, and 100 days of neither. What is the number of days when there is rain and snow?

Answer: **50**

Extra credit question: if on the same planet rain and snow come at random, are they independent?

Answer: **yes**