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.

(1) Suppose that $A$ and $B$ are events for which $P(A) = 0.4$, $P(B) = 0.3$ and $P(A \cap B) = 0.2$. 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