

Please write ***Your name:*** _____

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 a box has 3 red marbles and 2 black ones. We select 2 marbles. What is the probability that second marble is red given that the first one is red?

(2) Suppose that 36% of families own a dog, 30% of families own a cat, and 22% of the families that have a dog also have a cat. What is the probability that a family is chosen at random has a dog and a cat?

(3) In the same situations, a family is chosen at random and found to have a cat. What is the probability they also own a dog?

(More on the back)

(4) An urn has 5 blue balls and 8 red balls. Each ball that is selected is returned to the urn along with an additional ball of the same color. Suppose that 3 balls are drawn in this way. What is the probability that the three balls are blue?

(5) Suppose that 60% of UConn students will be at randomly exposed to the flu. If you are exposed and did not get a flu shot, then the probability that you will get the flu (after being exposed) is 80%. If you did get a flu shot, then the probability that you will get the flu (after being exposed) is only 15%. What is the conditional probability that a person who got a flu shot will get the flu?

(6) In the same situation, what is the conditional probability that a person who did not get a flu shot will get the flu?