

Please write ***Your name:*** \_\_\_\_\_

**Show all work.** You should either write at a sentence explaining your reasoning, or annotate your math work with brief explanations. There is no need to simplify, and no calculators are needed.

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- (1) Four balls are randomly withdrawn without replacement from a bowl containing 5 white and 3 black balls. What is the probability that two balls are white and the other two are black?

- (2) Four balls are randomly withdrawn with replacement from a bowl containing 5 white and 3 black balls. What is the probability that two balls are white and the other two are black?

(3) Suppose you roll two dice,  $E$  is that the sum is 3,  $F$  that the first is a 2. Are  $E$  and  $F$  independent?

(4) Suppose you toss a fair coin repeatedly and independently. If it comes up heads, you win a dollar, and if it comes up tails, you lose a dollar. Suppose you start with \$2. What is the probability that you will get up to \$4 before you go down to \$1?

(End of the quiz)