MATHEMATICS

Homework 9. Conditional Probability, Random Variables

In the questions 1, 2 and 3 you have to choose 1 correct answer from the list, in the questions 4 and 5 you have to give a solution.

Question 1 (1 answer)**.** Bag A contains 2 ambers, bag B contains two rubies and bag C contains 1 amber and 1 ruby. A bag is selected at random, and one stone is taken at random from that bag. If it is a ruby, the probability that it was taken from bag C is

A 1

B 1/2

C 1/3

D 1/4

E 1/6

Question 2 (1 answer)**.** Two cards are drawn from a deck of 52 cards. Let X represent the number of queens among them. Denote by f the probability function of X. Then

A $f(0) = 1$

B $f(1) = 1/13$

C $f(2) = 1/221$

D $f(3) = 1/135$

E $f(4) = 1/52$

Question 3 (1 answer)**.** A bowl contains 3 red balls, 2 white balls and 1 blue ball. Then the expected number of white balls obtained if three balls are selected at random from the bowl is

A 0.5

B 1

C 1.2

D 1.5

E 2

Question 4. Let E be the event of generating at random a 4-bit string that contains an even number of 1s and let F be the event of generating at random a 4-bit string that ends with 0. Determine (with an explanation) whether E and F are independent.

Question 5. A die is tossed and the number obtained is recorded on a piece of paper. Then a coin is flipped twice. If tails comes up both times, then the die is tossed a second time and the number obtained on the die is added to the number on the paper. What is the expected final number on the paper?