1. Our CSCI E-120 class has (had?) 19 students and 2 TAs for 21 participants total. Assume that the birthday of the participants are independent uniform random variables and that nobody was born on Feb 29.

   (a) What is the probability that a given pair of participants in the class shares the same birthday? Give your answer as a decimal to 3 decimal places.

   (b) What is the probability that there exists a pair of participants in the class that has the same birthday? Give your answer as a decimal to 3 decimal places.

   (c) A participant is a “lonely participant” if no other participant shares his/her birthday. What is the expected number of lonely participants in the class? Give your answer as a decimal to one decimal place.