

MATH 101
SPRING 2023
EXAM 4

NAME:

1. 10 pts. One card is selected from a deck of playing cards. Find the probability of selecting a jack or a diamond.
2. 10 pts. each Two cards are selected at random. Find the probability the first card is an ace and the second also an ace...
 - (a) with replacement.
 - (b) without replacement.
3. 10 pts. Each question on a ten-question multiple-choice exam has four possible answers. Chet Buzzcut picks an answer to each question at random. Determine the probability that he selects the correct answer on only the first, fourth, and tenth question.
4. 10 pts. each Consider the data below giving the ages of a sample of Vulcan citizens.

AGE	MALE	FEMALE	TOTAL
0-60	61	40	101
61-120	109	85	194
over 120	21	14	35
Total	191	139	330

If an individual is selected at random, find the probability that the person is:

- (a) 0-60 years old, given the person is male.
 - (b) Female, given the person is over 120.
 - (c) 61-120 or over 120, given the person is male.
5. 10 pts. each Assume that a password to log onto a computer account is to consist of four letters followed by two digits. Determine the number of possible passwords if:
 - (a) Repetition is not permitted.
 - (b) Repetition is permitted.
6. 10 pts. A bank has three drive-through stations. Assuming that each is equally likely to be selected by customers, in how many different ways can the next 10 drivers select a station?
7. 10 pts. Determine the total number of possible permutations of the letters in the Maori word WHAKAPUKAPUKATANGA.
8. 10 pts. Professor Plaidbritches bought 26 different Hummel figurines on e-Bay, but she only has room for 18 of them on her mantel. In how many ways can she select 18 Hummels to display on the mantel?

9. 10 pts. Office Despot has 12 different printers and 8 different monitors in stock. The manager wants to place 5 of the 12 printers and 3 of the 8 monitors on sale. In how many ways can the manager select the items to be listed as sale items?
10. 10 pts. The numbers 0 through 15 are put in a hat on slips of paper. If four slips are selected at random, what's the probability that the four numbers selected are greater than 6?
11. 10 pts. A game show has 7 doors, of which the contestant must pick 2. Behind 2 doors are cars, and behind the other 5 doors are solar-powered sun dials. A contestant wins what's behind the chosen doors. Determine the probability that the contestant wins:
- (a) Both cars.
 - (b) At least one car.
12. 10 pts. A pair of aces and a pair of 8's is known as a "dead man's hand." Determine the probability of being dealt a dead man's hand (any two aces, any two 8's, and one other card that is not an ace or an 8) when 5 cards are dealt without replacement.
13. 10 pts. A quality control engineer at the Illuminati lightbulb plant finds that 0.24% of its bulbs are defective. Determine the probability that exactly 3 of the next 50 bulbs made are defective.
14. 10 pts. each Ronald Weasely accidentally drank his own forgetfulness potion during breakfast, and is faced with completing a numerology quiz with no recollection of what numerology even is. The quiz consists of eight multiple-choice questions, each question consisting of five choices: one right choice and four wrong ones. Hermione won't let him cheat off her paper, so he must guess his way through every question. Find the probability that Ron answers...
- (a) At least 70% of the questions correctly, thereby passing the quiz.
 - (b) At least one question correctly.