

(Due Tuesday 02/05/2019 right before the class)

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(Your homework shall be stapled if it contains multiple pages.)

SPRING/2019/MA526: HOMEWORK 2 (Answers)

Instructor: Guangqu Zheng¹; Grader: Chessa Mccalla²

Total points: 20

Q1 (4 points) How many different letter arrangements can be made from the letters in the word STATISTICAL ?

2S
3T
2A
2I
1C
1L

11 letters in total.

so the total ways to permute these letters = $\frac{11!}{(2!)(3!)(2!)(2!)(1!)(1!)} = 831600$

Q2 (4 points) There are two bags called A and B. In bag A, there are 4 objects and in bag B, there are 3 objects. These 7 objects are all different. Now you are asked to pick in total 4 objects from these two bags subject to one condition that you need to pick at least one object from bag B. So how many different ways?

Final result = 12 + 18 + 4 = 34

Case ①: get 1 object from B, 3 from A → $\binom{3}{1} \times \binom{4}{3} = 12$
Case ②: get 2 object from B, 2 from A → $\binom{3}{2} \times \binom{4}{2} = 18$
Case ③: get 3 object from B, 1 from A → $\binom{3}{3} \times \binom{4}{1} = 4$

Q3 (4 points) A pair of fair dice is tossed. Find the probability of getting a total of 8. Also find the probability of getting at most a total of 5.

A pair of fair dice is tossed, you get 2 numbers (i, j)

$1 \leq i, j \leq 6$. There're 36 possible outcomes each occurring with probability $\frac{1}{36}$

Q4 (8 points) Do exercise 2.66 in the textbook.

see next page

(1) {Getting a total of 8} = {(2, 6), (3, 5), (4, 4), (5, 3), (6, 2)} happens with probability $\frac{5}{36}$

(2) {Getting at most a total of 5} = {(1, 1), (1, 2), (1, 3), (1, 4), (2, 1), (2, 2), (2, 3), (3, 1), (3, 2)} happens with probability $\frac{10}{36} = \frac{5}{18}$

Ans: $\frac{5}{18}$

¹gzheng90@ku.edu; Office hours: TuTh 11:00-11:50; Office = 641 Snow Hall
²chessa_m@ku.edu

Exercise 2.66 in the textbook:

Shift

Unsafe Cond.

Human error

Day

5%

32%

Evening

6%

25%

Graveyard

2%

30%

(a) $2\% + 30\% = 32\%$

(b) $32\% + 25\% + 30\% = 87\%$

(c) $5\% + 6\% + 2\% = 13\%$

(d) $1 - 5\% - 32\% = 1 - (37\%) = \boxed{63\%}$

or $\underbrace{6\% + 25\%}_{\text{evening}} + \underbrace{2\% + 30\%}_{\text{Graveyard}} = 31\% + 32\% = \boxed{63\%}$