HW4
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These are the solutions in blue to at least 60% of the problems for chapter 4.
Everything that is not in blue is part of my notes.

Problem 4.6

This means that the probability of a serious event is 1/100000 which is the proportion of a serious event occurring from data of many trials.

Problem 4.21

Blood Type	A	B	AB	O
US Probability	0.4	0.11	0.04	0.45

part a — The probabilty of blood type O blood in the United states is 1-(0.4+0.11+0.04) which is 0.45 .

part b — The probability that Maria can safely receive randomly chosen blood safely is 0.11+0.45 which is equal to 0.56 .

Problem 4.22

Blood Type	A	B	AB	O
US Probability	0.27	0.26	0.12	0.35

The probability that a randomly chosen American and Chinese both have type O blood is 0.35*0.45 which is 0.16 .

0.16

The probability that both have the same blood type is (0.4*0.27+0.26*0.11+0.12*0.04+0.35*0.45) which is 0.3 .

0.3

Problem 4.24

part a — The probability that should replace “?” is 1-(0.23+0.07+0.11) which is equal to 0.59 .

0.59

part b — The probability that a Canadian's mother tongue is not English is 1-0.59 which is 0.41 .

0.41

Problem 4.25

part a — The probability that a randomly chosen young adult has some education beyond high school is at least 0.31 .

part b — The probability that a randomly chosen young adult has at least a high school education is 0.88 .

0.88

Problem 4.28

	Hispanic	Not Hispanic
Asian	0.000	0.036
Black	0.003	0.121
White	0.060	0.691
Other	0.062	0.027
	0.13	0.88

part a Since the sum of probabilities of Hispanic and Not Hispanic is 1 there is a legitimate assignment of probabilities.

part b The P(A) is 0.13 which is the sum of Asian, Black, White, and Other for Hispanic people.

part c Hispanic and Not Hispanic groups make up everyone since B makes up Hispanic for Asian, Black, White, and Other than not B in other words Bs complement must be everyone else, so to find the probability of Bs complement I would take 1-(0.036 + 0.121 + 0.691 + 0.027) which is equal to 0.13 .

0.13

part d Given the probability of B: P(B) is the sum of 0.036 + 0.121 + 0.207 which I shall call P(X) plus 0.691.
Then the probability that a person is a non-Hispanic White is is 1-(P(A)+(P(B)-P(X))
The probability of a non-Hispanic white is 0.691 .

1-(P(A)+(P(B)-P(X))

1.57

0.69	0.88
0.69	0.16
0.18	1.07

Problem 4.30 Yes, events A and B are independent since being White does not influence whether a person is Hispanic or not.

Problem 4.34 The probability that at least one of them will have type O blood is 0.07*10 which is 0.7 .

$$\frac{7}{100} \times 10 \qquad \frac{7}{100} \times 1$$

100x=7*10
X=(7*10)/100

0.7

100x=7
X=7/100

0.07

10 x
100 7

7*10=100*x
X=(7*10)/100 0.7
0.7

Problem 4.36

part a The probability that none of the calls reaches a live person is (1-0.2)^5 which is equal to 0.33 .
0.33

part b The probability that none of the calls reaches a person in New York is (1-0.08)^5 which is equal to 0.66 .
0.66

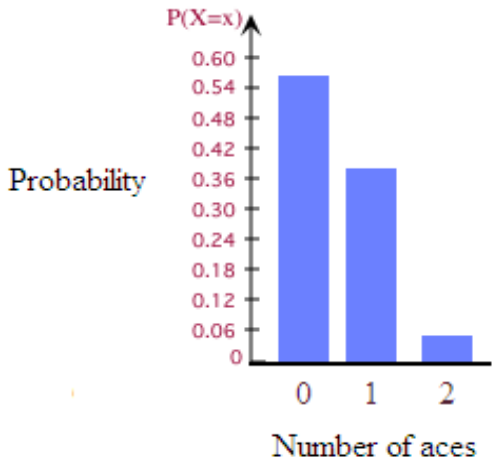
Problem 4.50

part a Since 0.559 + 0.382 + 0.059 = 1 the assignment of probabilities for this discrete distribution is ok.
1

part b

Number of ace	0	1	2
Probability	0.559	0.382	0.059

Probability	Number of aces
0.559	0
0.382	1
0.059	2



Outcomes

part c The probability that a hand contains at least one ace is 0.382 .
One way to calculate this probability is 1-(0.559+0.059) .
Another way to calculate this probability is 0.382^1 which means the chance I have of getting this ace in one hand.

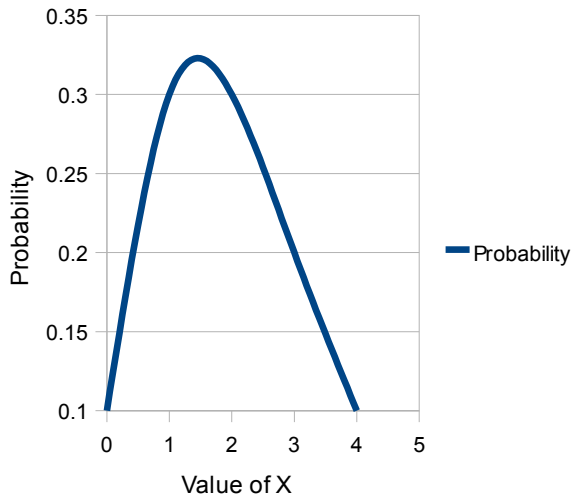
Probability	Number of aces	Y	N
0.559	0	N	Y
0.382	1	Y	Y
0.059	2	N	N

0.382

Problem 4.51

Value of X	0	1	2
Probability	0.1	0.3	0.3

part a



part b P(X≥1)
The probability of this event is P(1)+P(2)+P(3)+P(4).
Thus, P(X≥1) = 0.9 .

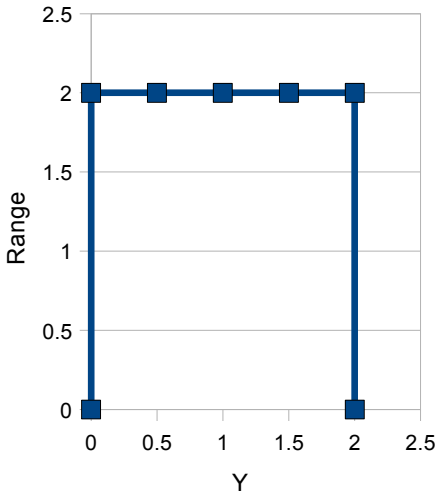
0.9

part c The probability of X≤2 is just the probability of 0.1 for the zeroth value

of X plus the probability of 0.3 for the first value of X plus the probability of 0.3 for the second value of X.
The probability of X≤2 is 0.7 .
The probability of X<2 is P(0)+P(1) = 0.4 .

Problem 4.63

part a



Range	Y
0	0
2	0
2	0.5
2	1
2	1.5
2	2
0	2
0	2.5

The height between the 0 and 2 is 2 .

part b The area under the curve where Y is ≤ 1.5 is 1.5*2 which is equal to 3.0 .

part c The area is (1.7-0.6)*2 which is 2.2 . 2.2

part d The area is (2.0 – 0.9)*2 which is 2.2. . 2.2

Problem 4.83

part a In this case I assume they are dependant.
In this case I assume they are dependant since the score is dependant on the possible subset of X in the set Y.

part b In this case I assume they are independant.

I assume independence in this case since dice do not have memory, so each succesive roll of the dice does not influence the next roll of the dice.

Problem 4.84

	Mean	Standard Deviation	176.8cm	1in
centimeters	176.8	7.2		2.54cm
inches	69.61	2.83		

Problem 4.103

part a

	Men	Women
4 yr institution	0.0000	0.6100
2 yr institution	0.1599	0.2301

61% attend 4 yr institions and the rest attend 2 yr institutions.
Males make up 44% of the students in 4 year institutions.
Males make up 41% of the students in 2 year institutions.

part b The probability that a woman chosen at random attends a 4 year institution is (0.3416)/(0.2684+0.3416) which is 0.5600 .

0.2739
0.97
???????

4.35
0.51

Problem 4.106

P(A)	P(B)	P(A and B)	P(A or B)
0.138	0.261	0.082	0.317

The probability that the household selected is either prosperous or educated is P(A)+P(B)-P(A and B) which is 0.138+0.261 – (0.082) which equals 0.317 .

Problem 4.110 The questions is asking in mathematical terms P($1,000,000.00|100,000 which is equal to 0.000769 .
P($1,000,000.00|100,000.00)

312226042	0.000769	
12757005		
240128	0.04	0.000769

Problem 4.116

	Bachelor's	Master's	Professional	Doctorate
Female	993	402	51	26
Male	661	260	44	26
sum all	2463			

part a

	Bachelor's	Master's	Professional	Doctorate
Female	0.4032	0.1632	0.0207	0.0106
Male	0.2684	0.1056	0.0179	0.0106
sum all	1			

part b

P(Woman)
0.6

The probability of choosing a woman is 0.6 .

part c

Probability that a person chosen got a professional degree is 0.04 .
0.04

Probability that a person chose is a women is 0.6, so
P(woman|person who got a professional degree is) = 0.0345 .
Which is (probability of both woman and professional degree)
/(probability of choosing a woman).
0.0345

part d

The events “choose a woman” and “choose a professional degree recipient” are not independent;
since “choosing a professional degree recipient” has a part that contains males and not just females.

Problem 4.118

Highest Educa	Total Populati	In labor force	Employed	Unemployment
Did not finish h	28021	12623	11552	3846
High school bu	59844	38210	36249	-14615
Some college,	46777	33928	32429	-19580
College gradu	51568	40414	39250	-28096

The unemployment rate becomes closer and closer to zero as the

education level increases.
If being employed and level of education were not related they would not be directly proportionate to one another.

Uemployment Rate
3.28
-2.61
-1.73
-1.44

Probability	Number of aces
0.559	0
0.382	1
0.059	2

0.38

3	4
0.2	0.1

0.39

10/31/99

0.39

1.0000

0.84

1

0.5975

0.5975

4.35

0.84

.00)

sum all
2463

sum all
1

Uemployment Rate
3.28
-2.61
-1.73
-1.44

9 mean

1.5

sd

5.05 0.27

o 0.35

0.096119

http://www.sciencenews.org/

0.88

2.25

0.49 212

2340

-2.5

0.9938

250

-0.71

72.86

72.22

8.96

8.25

'

1	2	3	4	5	sum
0.35	0.12	0.04	0.02	0.01	0.53563

view/generic/id/47981/title/Mitochondria_behind_life_span_extension

0
0.69
0.00321502