Q1 Probabilistic Inference
10 Points

Your box of cereal may be a contest winner! It's rattling, which 100% of winning boxes do. Of course 1% of all boxes rattle and only one box in a million is a winner. What is the probability that your box is a winner?

Note on answer formatting: Please specify your answer as a decimal probability (i.e. .05 rather than 5%). Do not include zeros before the decimal. To receive credit, your answer must match ours exactly.

0.0001

Q2 Events
14 Points

You are playing a solitaire game in which you are dealt three cards without replacement from a simplified deck of 10 cards (marked 1 through 10). You win if one of your cards is a 10 or if all of your cards are odd.
How many winning hands are there if different orders are different hands?

276

What is your chance of winning? (round your answer to 3 decimal places)

0.383

Q3 Expectations
18 Points

Someone rolls a fair six-sided die and you win points equal to the number shown.

What is the expected number of points after one roll?

3.5

After 2 rolls?

7

After 100 rolls?

350

Q4 Conditional Probabilities
13 Points

Select all of the following statements that are true for all joint distributions over X and Y.

- [ ] $P(x,y) = P(x)P(y)$
- [x] $P(x,y) = P(x|y)P(y)$
- [ ] $P(x,y) = P(x \mid y)P(y \mid x)$
- [ ] $P(x) = \sum_y P(x \mid y)$
- [x] $P(x) = \sum_y P(x,y)$
- [ ] none of the above

Q5 Linear Equations
14 Points

Homework 0 ● GRADED

STUDENT
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TOTAL POINTS
82 / 82 pts

QUESTION 1
Probabilistic Inference **10** / 10 pts

QUESTION 2
Events **14** / 14 pts

QUESTION 3
Expectations **18** / 18 pts

QUESTION 4
Conditional Probabilities **13** / 13 pts

QUESTION 5
Linear Equations **14** / 14 pts

QUESTION 6
Logarithms **13** / 13 pts

You know that $x = \frac{1}{2}y + \frac{1}{2}(x+1)$ and $y = \frac{1}{3}y + \frac{1}{3}(x+2)$
What is x?

4

What is y?

3

Q6 Logarithms

13 Points

Select all of the following statements that are true.

- [ ] $2^{x*y}=2^x 2^y$
- [x] $2^{x+y)}=2^x 2^y$
- [ ] $2^{x+y}=2^x+2^y$
- [ ] $log(3^x)=log(3)log(x)$
- [ ] $log(3^x)=xlog(3)$
- [ ] $log(3^x)=3x$
- [ ] None of the above.