MATH 1342

Homework 3 (Sections 3.1 – 3.2)

Instructions: Answer all questions through the EMCF tab of casa under the assignment named "Homework 3" before the deadline.

There is no "Submit" button. Your answers will be automatically submitted once the deadline arrives.

Assignments will be graded out of 20 points.

1. Section 3.1; Problem 2

    A. 0.35   B. 0.45   C. 0.20   D. 0.55   E. 0.85

2. Section 3.1; Problem 4

    A. 3.75   B. 4   C. 0.1429   D. 2.0714   E. 1.50

3. Section 3.1; Problem 6

    A. 3.788   B. 1.946   C. 14.349   D. 14.1   E. 3.755

4. Section 3.1; Problem 18

    A. Mean: 0.5; Variance: 0.64; Standard Deviation: 0.8

    B. Mean: 0.25; Variance: 1.04; Standard Deviation: 1.08

    C. Mean: 0.4; Variance: 1.04; Standard Deviation: 1.08

    D. Mean: 0.3; Variance: 1.07; Standard Deviation: 1.14

    E. Mean: 0.4; Variance: 1.04; Standard Deviation: 1.02
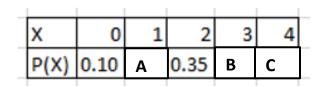
5. Section 3.1; Problem 19

    A. Mean: 3.33; Variance: 1.03; Standard Deviation: 1.01

    B. Mean: 2.6; Variance: 0.84; Standard Deviation: 0.706

    C. Mean: 2.6; Variance: 0.84; Standard Deviation: 0.917

    D. Mean: 2.6; Variance: 0.706; Standard Deviation: 0.84

    E. Mean: 0.33; Variance: 0.076; Standard Deviation: 0.276

6. Section 3.1; Problem 20

    A. Mean: 3.4; Variance: 4.16; Standard Deviation: 2.08

    B. Mean: 2.0; Variance: 2.08; Standard Deviation: 4.33

    C. Mean: 3.8; Variance: 2.08; Standard Deviation: 1.44

    D. Mean: 3.8; Variance: 4.16; Standard Deviation: 2.04

    E. Mean: 3.8; Variance: 4.16; Standard Deviation: 17.31

Use the following Probability Distribution Table to answer questions 7, 8, and 9.

In the following distribution, $P(X < 2) = 0.35$, and expected value is 1.9

X	0	1	2	3	4
P(X)	0.10	A	0.35	B	C

7. Use the fact that $P(X < 2) = 0.35$ to find the value of A.

A. 0.00   B. 0.25   C. 0.15   D. 0.10   E. 0.05

8. Determine the value of B. *(Hint: you will want to create two equations: the first using the fact that the total probability is equal to 1.0, and the second using the given expected value, then solve by the substitution method.)*

A. 0.00   B. 0.25   C. 0.15   D. 0.10   E. 0.05

9. Determine the value of C.

A. 0.00   B. 0.25   C. 0.15   D. 0.10   E. 0.05

10. Section 3.2; Problem 4

    A. Binomial distribution, n = 20; p = 0.02, 2 outcomes, independent trials

    B. Not Binomial, n = 20, p is not fixed, 2 outcomes, dependent trials

    C. Not Binomial, n is unknown; p = 0.02, 2 outcomes, independent trials

    D. Not Binomial, n = 20, p = 0.02, more than 2 outcomes, independent trials

    E. Not Binomial, n = 20, p =0.02, more than 2 outcomes, dependent trials

11. Section 3.2; Problem 12 (a)

    A. 0.994091   B. 0.014798   C. 0.005909

        D. 0.985214   E. 0.176917

12. Section 3.2; Problem 12 (b)

    A. 0.979305   B. 0.036964   C. 0.963036

        D. 0.020695   E. 0.073929

13. Section 3.2; Problem 12 (c)

    A. Mean: 5; Standard Deviation: 2.5

B. Mean: 10; Standard Deviation: 2.236

C. Mean: 5; Standard Deviation: 1.581

D. Mean: 10; Standard Deviation: 5

E. Mean: 10; Standard Deviation: 2.5

14. Section 3.2; Problem 14 (a)

15. Section 3.2; Problem 14 (b)

16. Section 3.2; Problem 14 (c)

Choices for Questions 14, 15, and 16:

A. 0.67780

B. 0.69801

C. 0.99992

D. 0.30199

E. 0.0000793

Use the following scenario for questions 17 and 18:

A fair, six-sided die is rolled three times.

17. Determine the values of w, x, y, and z in the probability distribution table, where event X represents the number of times of die lands on a 6.

X	0	1	2	3
P(X)	w	x	y	z

A. w = 0.25; x = 0.25; y = 0.25; z = 0.25

B. w = 0.167; x = 0.167; y = 0.167; z = 0.167

C. w = 0.0; x = 0.167; y = 0.333; z = 0.5

D. w = 0.579; x = 0.347; y = 0.069; z = 0.005

E. w = 0.579; x = 0.074; y = 0.005; z = 0.00

18. Determine the expected number of times the die should land on 6.

A. 3   B. 2   C. 0.167   D. 0.5   E. 1.5

19. A manufacturer of light bulbs knows that, out of every package of 5 sold, there is an expectation that 1 will be defective. A customer purchases 3 of these packages (a total of 15 light bulbs). What is probability that at most 2 are defective?

   A. 0.6020   B. 0.3980   C. 0.0037   D. 0.6482   E. 0.0176

20.   In the following distribution, calculate the mean, and standard deviation:

x	0	1	2	3	4
p(x)	.5	.3	.15	.03	.02

Proposed Solution:

assign("x",c(0,1,2,3,4))

mean(x) = 2

   What was done wrong in the proposed solution?
      A. The mean should be taken of the p(x) entries as well as the x entries.

      B. Since this is a probability distribution table, each x-value carries different
          weight, which was no considered in the calculation used.

      C. Since the probabilities add up to 1.0, the mean must be 0.5

      D. All values in the table should be added together and then divided by 10.

      E. There is nothing wrong with the proposed calculation.