MATH-1110 (DUPRÉ) FALL 2018 TEST 1 ANSWERS

1. PRINT YOUR LAST NAME IN THE UPPER RIGHT CORNER IN LARGE CAPITAL LETTERS.

2. PRINT YOUR FIRST NAME UNDERNEATH YOUR LAST NAME IN THE UPPER RIGHT CORNER IN CAPITAL LETTERS.

3. PRINT YOUR LAB DAY AND START TIME AND LECTURE TIME UNDERNEATH YOUR FIRST NAME IN THE UPPER RIGHT CORNER.

For the next three problems, X and Y are unknowns, K is a statement, and assume their expected values given K are

$$E(X|K) = 7 \text{ and } E(Y|K) = 5.$$

4. What is $E(X+Y|K)$, the EXPECTED VALUE of $X+Y$ given K?

ANSWER: $E(X+Y|K) =$

ANSWER: $E(X+Y|K) = E(X|K) + E(Y|K) = 7 + 5 = 12.$

5. What is the expected value of $4X+2Y$ given K?

ANSWER: $E(4X+2Y|K) =$

ANSWER: $E(4X+2Y|K) = 4E(X|K) + 2E(Y|K) = (4)(7) + (2)(5) = 38.$

6. What is the expected value of $4X-6Y$ given K?

ANSWER: $E(4X-6Y|K) =$

ANSWER: $E(4X-6Y|K) = 4E(X|K) - 6E(Y|K) = (4)(7) - (6)(5) = -2.$

The remaining problems all use the following information. Donald Duck's zillionaire Uncle Scrooge has a large bin filled with jewelry in the basement of his Duckburg mansion. He has mistakenly assumed he can trust the notorious Beagle Boys to guard his assets at minimum wage. The jewelry bin contains diamonds, rubies, emeralds, sapphires, and gold nuggets all (jewels and gold) of which have total weight of 2 million pounds and valued at a total of 2 trillion (2,000,000,000,000) US dollars.

7. If one of the Beagle Boys makes off with a bag of jewels weighing 10 pounds, how much do we expect is the value of the jewels in the bag?

ANSWER: Since the goods here weigh 2 million pounds with a value of 2 trillion dollars, the value of each pound of jewels is expected to be 1 million dollars so a bag weighing 10 pounds is expected to be worth 10 million dollars

8. If five identical boxes each contain various (all different) amounts of Scrooge's jewels of total weight 10 pounds, and one is chosen at random without feeling to see how much the boxes weigh, what is the probability it is the box with the most jewels?

ANSWER: Since all five are equally likely to be the one with the most jewels, the probability it turns out to be the chosen box is 1/5.

9. If 2 of the identical boxes above are chosen without examining their weights, what is the expected total value of the jewels in the chosen boxes before looking to see what we have?

ANSWER: Since the total weight of the 5 boxes is 10 pounds, we expect each box to weigh 2 pounds and therefore if 2 boxes are chosen we expect to get 4 pounds and therefore 4 million dollars worth.

10. What do we expect for the total value of the jewels in the three remaining unchosen boxes from the previous problem?

ANSWER: Likewise, each of these three is expected to weigh 2 pounds so there value is expected to total 6 million dollars. Notice the 5 boxes all together are expected to be worth 10 million dollars so as the two previously chosen boxes are expected to be worth 4 million dollars, then it also makes sense that the remaining three are expected to be worth 6 million dollars.