Math 5710 Tuesday, 7/28/20 Quiz 25

1. What is your name?

2. Re-examine the following two definitions and compare the role played by the summation function in the discrete case to the role played by the integration function in the continuous case:

41A. Definition for *expected value* for a discrete random variable X:

Given $X \in$ { discrete random variables of Ω } $\wedge$
($m \in$ { discrete probability distribution for X }, ($E(X)$ is the *expected value* of X $\Leftrightarrow$
$E(X) = \sum_{x \in \Omega} x m(x)$ provided that the series converges absolutely).

Note: If the series does not converge absolutely, then X does not have an expected value.

47A. Definition for *expected value* for a continuous random variable X:

Given $X \in$ { continuous random variables of Ω } $\wedge$ ($f \in$ { density function for X },
($E(X)$ is the *expected value* of X $\Leftrightarrow$
$E(X) = \int_{-\infty}^{\infty} x f(x) dx$ provided that the definite integral $\int_{-\infty}^{\infty} |x| f(x) dx$ }exists.

Write a paragraph that describes the salient points of your comparison.

Sample paragraph:

In the discrete case, the summation function underlies the algorithm by which the sum of selected range values of a discrete random variable are computed. Similarly, in the continuous case, the integral function underlies the algorithm by which areas and volumes are computed. The relation between the two is reminiscent of the association between Riemann sums (the discrete case) and integrals (the continuous case).

Note: I found the direction for this prompt very confusing and I'm the one who wrote it.

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3. Of course the integral in Glossary Entry 47A helps us compute areas of certain geometric objects. Now suppose we were confronted by an experiment in which we needed to compute the double integral of a function. For such an experiment instead of examining random events related to areas of geometric objects, we would be examining random events related to _**volume**_______ of geometric objects. Fill in the blank.

4. Smile. ☹