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Properties of Expectations - Quiz

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Question 1

1/1 point (graded)

True or False: The expectation of a sum of random variables is equal to the sum of the expectations of each of those random variables.

- (•) True ✔
- ( ) False

Explanation

This is true. Given that Y is represented as a sum of several random variables, $X_1, X_2, \ldots, X_n$, then the expectation of Y is given by the sum of the expectations of $X_1, X_2, \ldots, X_n$. For example, if $Y = X_1 + X_2 + X_3$, then $E[Y] = E[X_1] + E[X_2] + E[X_3]$. This is one of the useful properties of expectation given in class.

Submit You have used 1 of 1 attempts

✔ Correct (1/1 point)

Question 2

1/1 point (graded)

Suppose that you have a function, $Y = 6X_1 + 3X_2 + 2X_3$ and you know that $E[X_1] = 3, E[X_2] = 4$ and $E[X_3] = 1.$ Using what you know about the properties of expectation, what is the expectation of Y?

32 ✔ **Answer:** 32

32

Explanation

The expectation of Y can be calculated as follows:

$$E[Y] = 6 * E[X_1] + 3 * E[X_2] + 2 * E[X_3] = 6 * 3 + 3 * 4 + 2 * 1 = 32.$$

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✔ Correct (1/1 point)

Question 3

1/1 point (graded)

True or False: If $Y = X_1 * X_2$, then it is always true that $E[Y] = E[X_1] * E[X_2]$.

a. True

b. False ✔

Explanation
This is only true in cases where X_1 and X_2 are independent.

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