

1. Let X and Y be two random variables and assume all the expectations below are finite. Which identity is always true?

A. $\mathbb{E}[X + Y] = \mathbb{E}[X] + \mathbb{E}[Y]$

B. $\mathbb{E}[XY] = \mathbb{E}[X]\mathbb{E}[Y]$

C. $\text{Var}(X + Y) = \text{Var}(X) + \text{Var}(Y)$

D. All of the above.

2. Let X be continuous with pdf f_X , and let $Y = 2X$. What is the pdf $f_Y(y)$ of Y ?

A. $\frac{1}{2}f_X(y/2)$

B. $2f_X(2y)$

C. $f_X(2y)$

D. $f_X(y/2)$

3. Before the data are observed, the frequentist viewpoint treats the unknown parameter θ and statistics $T(\underline{X})$, respectively, as:

A. fixed and random;

B. random and fixed;

C. both random;

D. both fixed.