
EX: A Gilbert cell is an electronic circuit that produces an output voltage that is equal to the product of two input voltages. If the input voltages, X and Y, are independent and uniformly distributed on [0,3], find the mean of $Z = XY$.

SOL'N: Since X and Y are independent, the mean of the product is the product of the means:

$$\mu_Z = \mu_X \mu_Y$$

The mean of a uniform distribution is its midpoint. Thus, we have the following value for our answer:

$$\mu_Z = \frac{3}{2} \cdot \frac{3}{2} = \frac{9}{4}$$