Problem 78

\[ f(x, y) = \frac{x+y}{27} \quad 0 < x < 3 \]
\[ 0 < y < 3 \]

Find \( p(\text{Device fails during 1st hour}) \)

Device fails when either of the 2 components fail

I) \( X \) fails, \( Y \) does not

Possibilities:

II) \( Y \) fails, \( X \) does not

III) Both \( X, Y \) fail

\[
\text{Total area inside dashed box is equal to 1}
\]

\[
\int_{0}^{3} \int_{0}^{1} \frac{x+y}{27} \, dy \, dx + \int_{0}^{1} \int_{x}^{3} \frac{x+y}{27} \, dx \, dy = .41
\]

\[
1 - \int_{1}^{3} \int_{1}^{3} \frac{x+y}{27} \, dy \, dx = .41
\]

[Answer: B]