Suppose random variables X and Y have joint probability density function $f_{X,Y}(u,v)$ which equals e^{-u} whenever $0 < v < u$, and equals zero elsewhere. What is the probability that X is less than one, given that Y is greater than one ?

(a) 0

(b) $1/2$

(c) $1/3$

(d) $1/4$

(e) $1/e$

(f) $2/e$

(g) $e/(1+e)$

(h) $(e-1)/(e+1)$

(i) $1/e^2$

(j) 1

(k) None of these

Solution:
The joint pdf if zero in the region $\{(u, v) : u < 1,\ v > 1\}$ so the probability is zero.