The joint probability density function of random variables X and Y is $f_{X,Y}(u,v) = 2e^{-u-2v}$ whenever $u, v > 0$, and is zero otherwise. What is the probability that $X + Y$ is less than 1 ?

(a) $(1 - e^{-1})^2$

(b) $1 - e^{-1}$

(c) $(1 - e^{-2})^2$

(d) $1 - e^{-2}$

(e) $1 - e^{-1} - e^{-2}$

(f) $1/e$

(g) $1/2$

(h) $1/e^2$

(i) e^{-3}

(j) $1 - e^{-3}$

(k) $1 + 2e^{-1} + e^{-2}$

(l) None of these