Suppose random variables X and Y are independent, each with probability density function satisfying $f(u) = e^{-u}$ when $u > 0$. What is the probability that $Y - 1$ is between X and $2X$?

(a) $1/(6e)$

(b) $1/(3e)$

(c) $1/6$

(d) $1/e$

(e) $6/e$

(f) $1/3$

(g) $1/2$

(h) $e/6$

(i) $1/(2e)$

(j) $1/e^2$

(k) $2/e$

(l) $e/3$

(m) None of these