Suppose a random variable X has a probability mass function which equals $p_X(k) = \frac{C}{2^k k!}$ for all integers $k \geq 1$, and equals zero elsewhere, where C is a constant. What is the probability that X^2 is less than three?

(a) $\frac{1/2}{\sqrt{e}-1}$

(b) $\frac{5/8}{\sqrt{e}-1}$

(c) $\frac{1}{\sqrt{e}-1}$

(d) $1/2$

(e) $1/4$

(f) $3/4$

(g) $\frac{1/2}{\sqrt{e}+1}$

(h) $\frac{1/2}{e-1}$

(i) $\frac{1/2}{e+1}$

(j) $\frac{2}{\sqrt{e}-1}$

(k) $\frac{1/4}{\sqrt{e}-1}$

(l) None of these