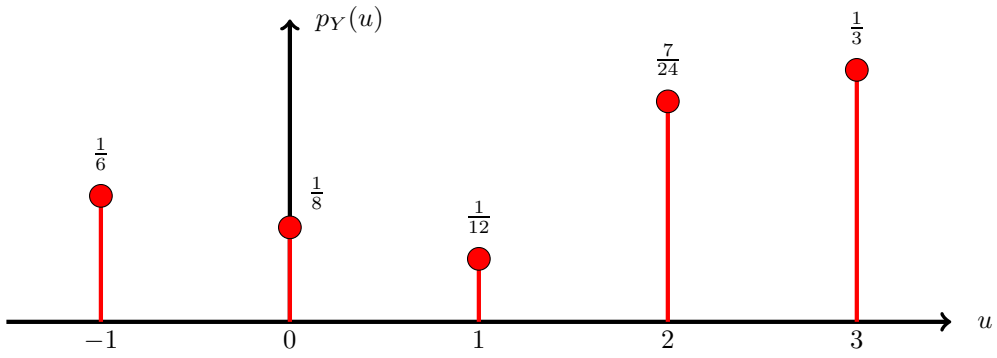
If a random variable Y has probability mass function shown below, then what is the probability that $Y^2 - 2Y - 3$ is nonnegative?



(a) 1/2

(b) 1/6

(c) 1/4

(d) 1/3

(e) 2/3

(f) 1/8

(g) 5/8

(h) 3/4

(i) 7/8

(j) 7/24

(k) 7/12

(l) None of these

A random variable X has a probability density function which equals Ae^{-u} on the interval $[0, 1]$ and is zero otherwise, where A is a constant. What is the probability that X is less than $1/2$?

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

(b) $\frac{e-1}{e-1}$

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

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

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

(f) $\frac{e-\sqrt{e}}{e+1}$

(g) $\frac{e^2}{e-1}$

(h) $\frac{e}{e+1}$

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

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

(k) $\frac{\sqrt{e}}{e+1}$

(l) $1/2$

(m) None of these

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