Suppose the joint probability mass function of random variables X and Y is $p_{X,Y}(u,v) = 2^{-(u+v)}$ whenever u and v are both positive integers, and is zero otherwise. What is the probability that $Y + (X-2)^2$ is greater than or equal to two?

(a) 7/8

(b) 1/2

(c) 1/4

(d) 1/8

(e) 1/16

(f) 3/4

(g) 15/16

(h) 3/8

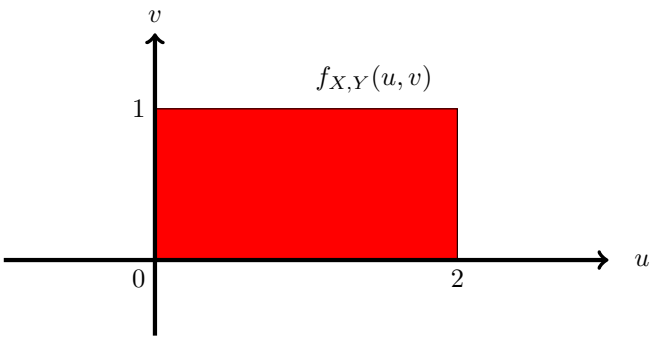
(i) 3/16

(j) 5/16

(k) 7/16

(l) None of these

If random variables X and Y have a joint pdf equal to $f_{X,Y}(u,v) = uv$ in the red rectangle in the figure below and which is zero elsewhere, then what is the probability that X is less than one?



(a) 1/4

(b) 1/2

(c) 1/8

(d) 1/16

(e) 1/3

(f) 2/3

(g) 3/4

(h) 3/8

(i) 3/16

(j) 5/16

(k) 5/8

(l) None of these

If X is a random variable that is uniform on $[0, 3]$ and $Y = e^X$, then what is the pdf value $f_Y(8)$?

(a) $1/24$

(b) $1/8$

(c) $1/3$

(d) $1/4$

(e) $1/12$

(f) $(\ln 8)/8$

(g) $(3 \ln 8)/8$

(h) $(\ln 8)/24$

(i) e^8

(j) $\ln 8$

(k) e^3

(l) None of these