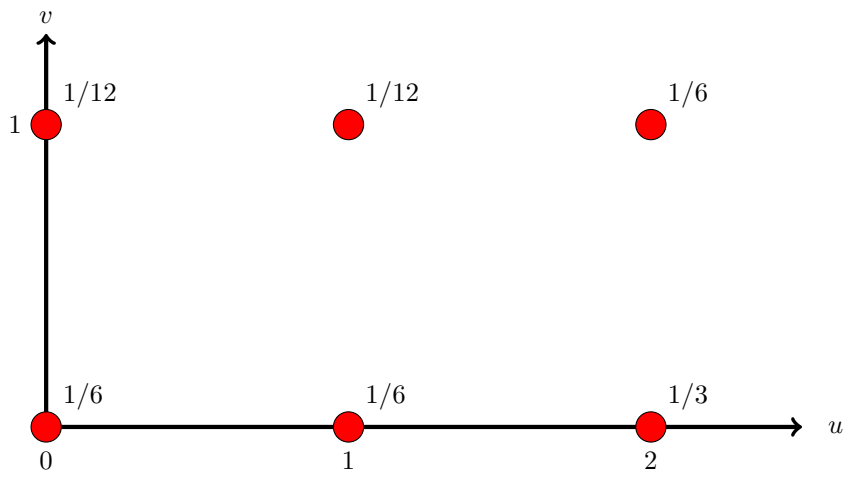
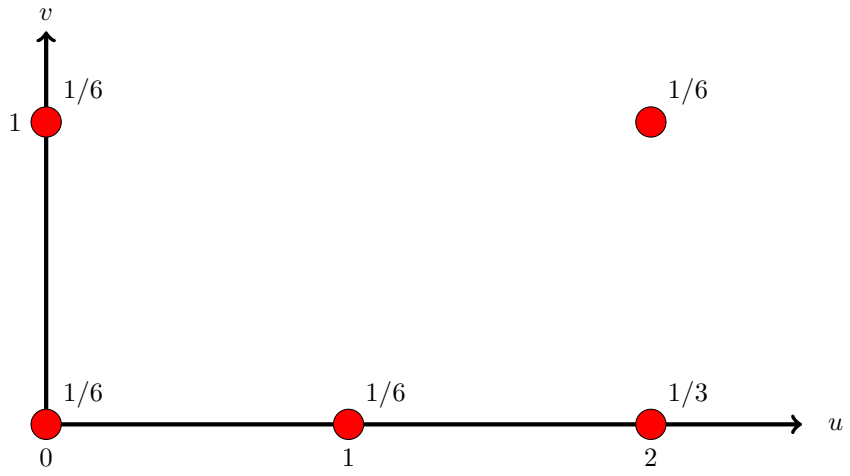
For which of the following joint probability mass functions $p_{X,Y}(u,v)$ are the random variables X and Y independent?

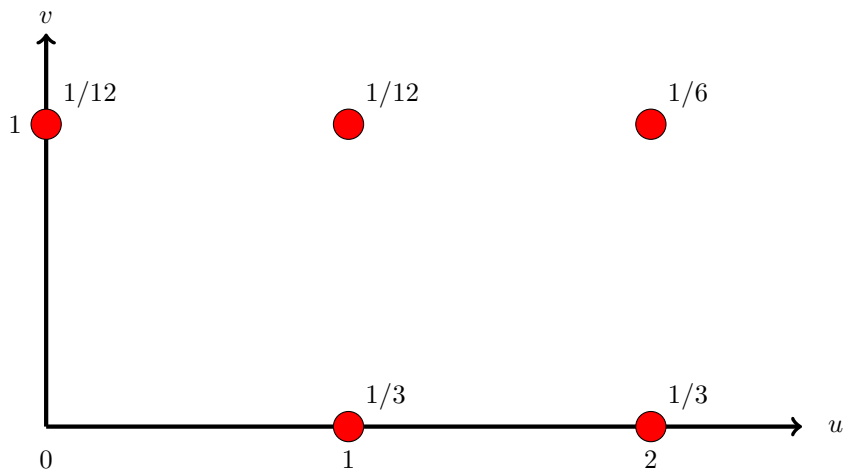
(a)



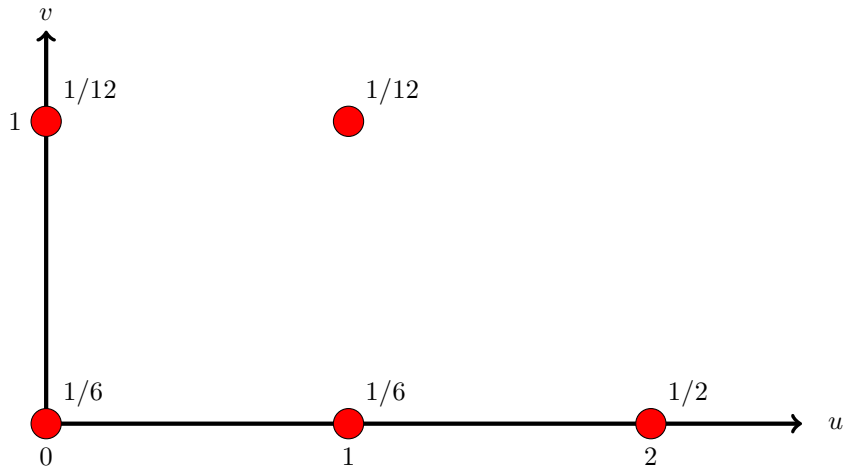
(b)



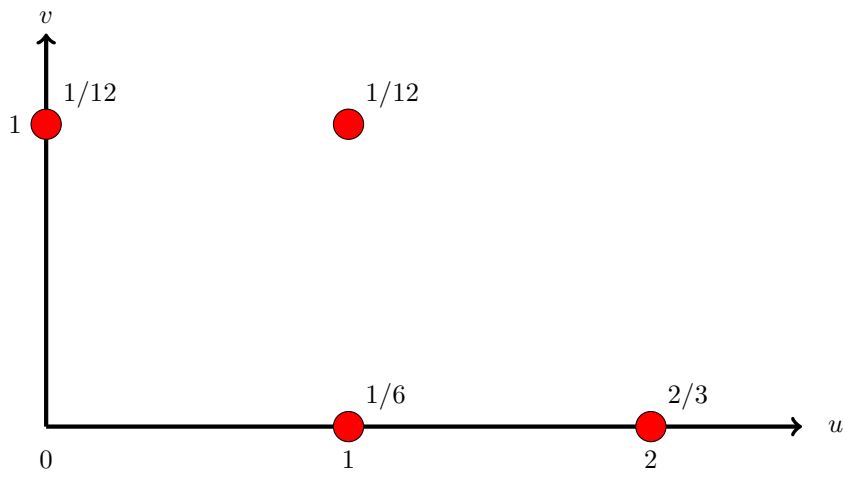
(c)



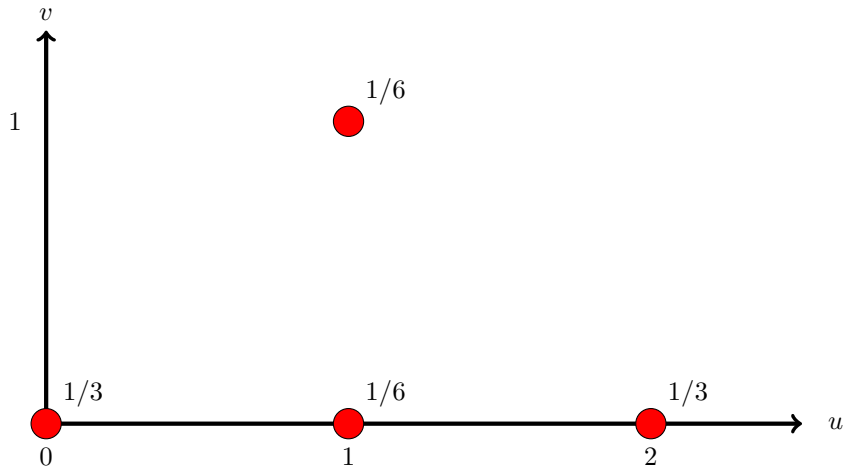
(d)



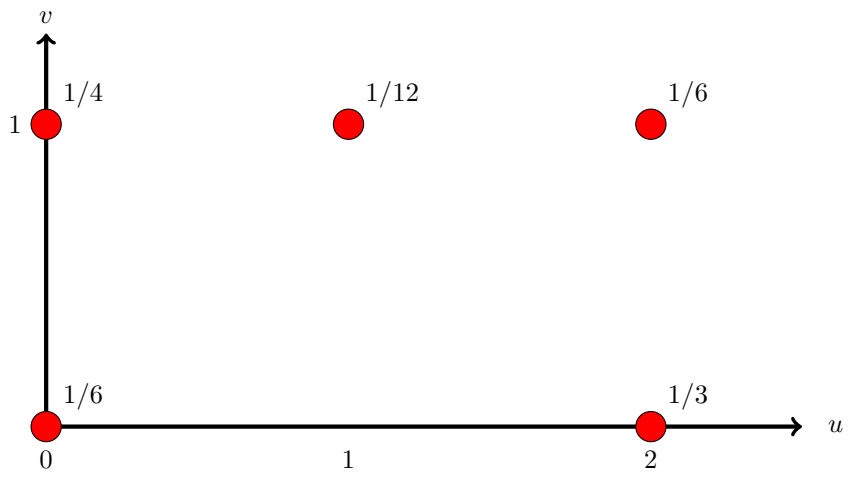
(e)



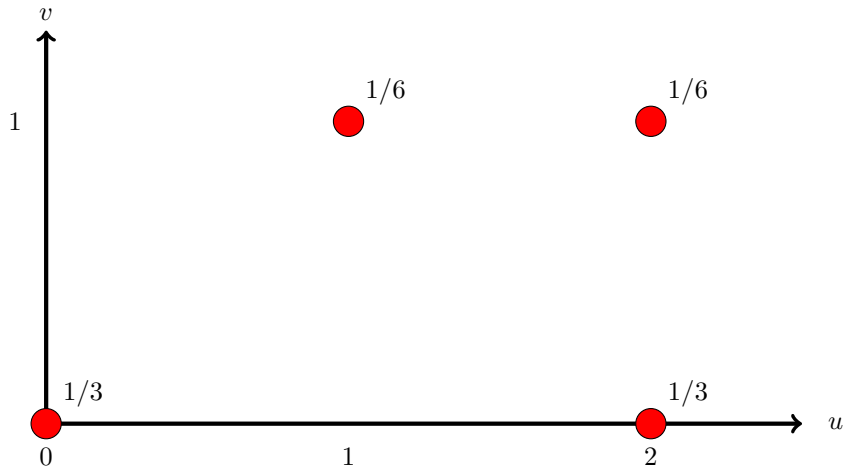
(f)



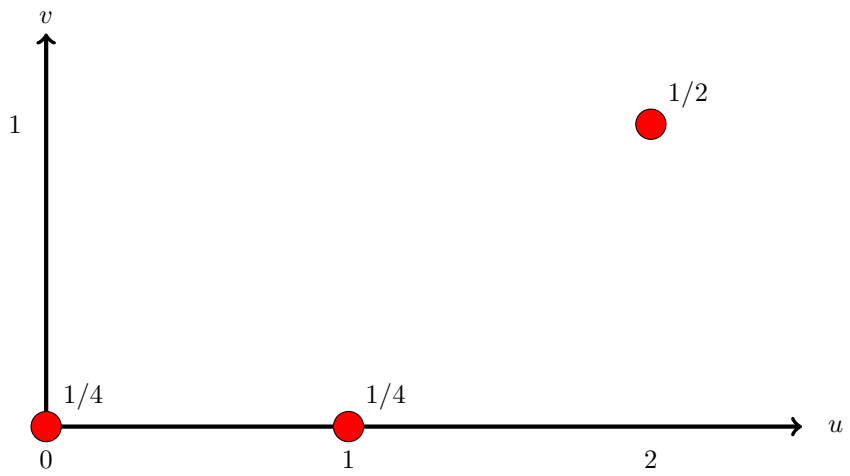
(g)



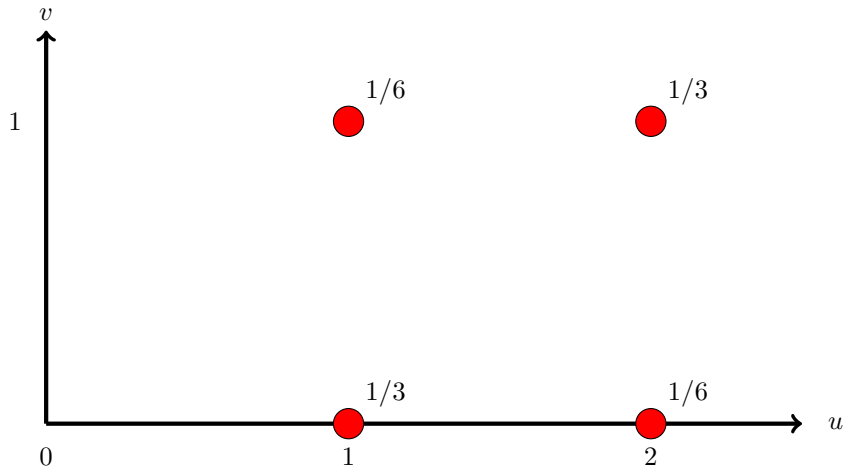
(h)



(i)



(j)



Suppose random variables X and Y are independent. If the probability density function of X is uniform on $[1, 2]$ and the probability density function of Y is uniform on $[0, 1] \cup [2, 3]$, then what is the probability that X is greater than $2Y$?

(a) 3/8

(b) 3/4

(c) 1/2

(d) 7/16

(e) 5/16

(f) 0

(g) 1

(h) 1/4

(i) 1/8

(j) 1/3

(k) 3/16

(l) 5/8

(m) None of these

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