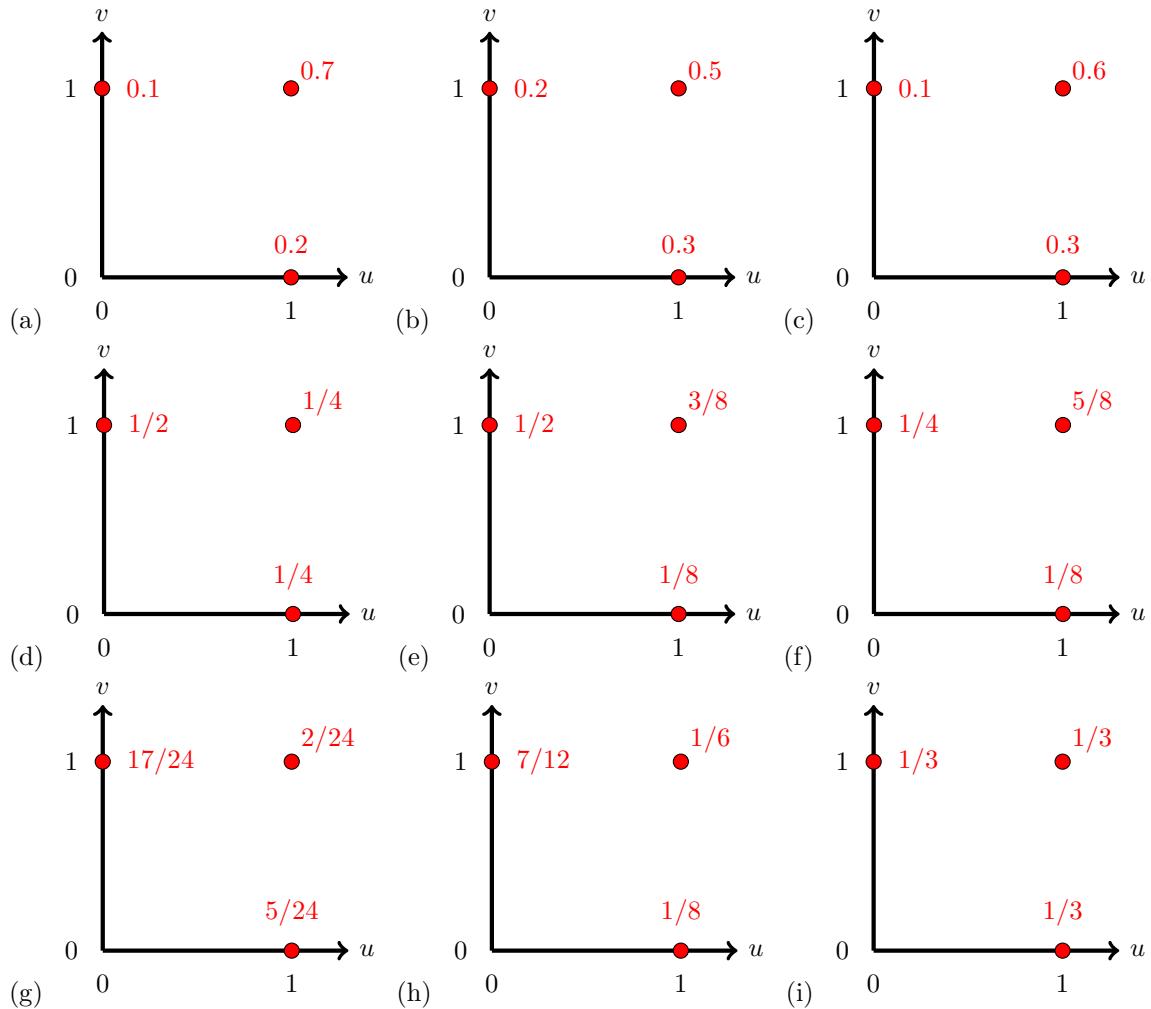


Let X and Y be random variables whose probability density function is uniform inside a circle centered at the origin and of radius 12. What is the probability that X and Y both lie in the interval $[0, 2]$?

- (a) $\left(1 / (36\pi)\right)$
- (b) $\left(1 / (6\pi)\right)$
- (c) $\left(\pi/ 6\right)$
- (d) $\left(\pi/ 36\right)$
- (e) $\left(1 / 36\right)$
- (f) $\left(1 / 144\right)$
- (g) $\left(1 / 6\right)$
- (h) $\left(1 / 12\right)$
- (i) $\left(1 / 2\right)$
- (j) $\left(1\right)$
- (k) $\left(0\right)$
- (l) None of these

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



- (a) None of these
- (b) (a)
- (c) (b)
- (d) (c)
- (e) (d)
- (f) (e)
- (g) (f)
- (h) (g)
- (i) (h)
- (j) (i)

Let X and Y be independent random variables whose probability density functions satisfy

$$f_X(u) = f_Y(u) = \begin{cases} e^{-u} & \text{if } u \geq 0 \\ 0 & \text{else} \end{cases}$$

What is the probability that Y is less than $4X$?

- (a) 4 / 5
- (b) 5 / 6
- (c) 3 / 4
- (d) 1 / 4
- (e) 1 / 5
- (f) 1 / 3
- (g) 1/2
- (h) 1/(4 e)
- (i) 3/(4 e)
- (j) 1
- (k) 0
- (l) None of these