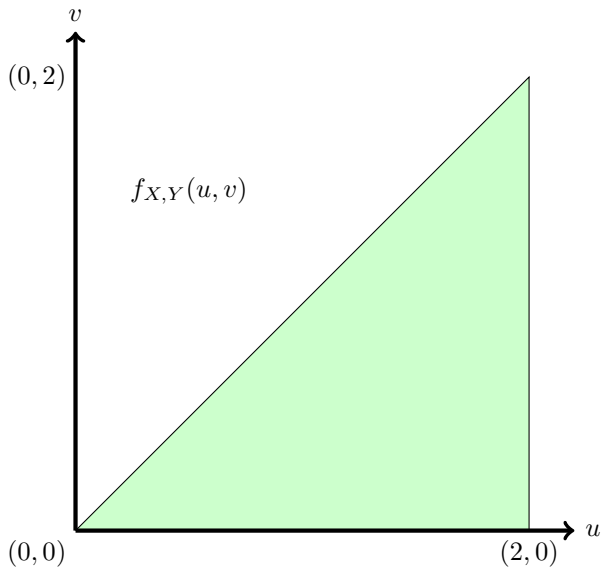
Suppose the joint probability density function $f_{X,Y}(u,v)$ of random variables X and Y equals $uv/2$ in the green triangle shown below, and equals zero elsewhere. What is the probability that X is less than one ?



(a) 1/16

(b) 1/32

(c) 1/2

(d) 1/12

(e) 1/4

(f) 1/6

(g) 1/64

(h) 1/3

(i) 1/24

(j) 1/8

(k) 1

(l) None of these

Solution:
$P(X < 1) = \int_0^1 \int_0^u (uv/2) dv du = (1/4) \int_0^1 u^3 du = 1/16$