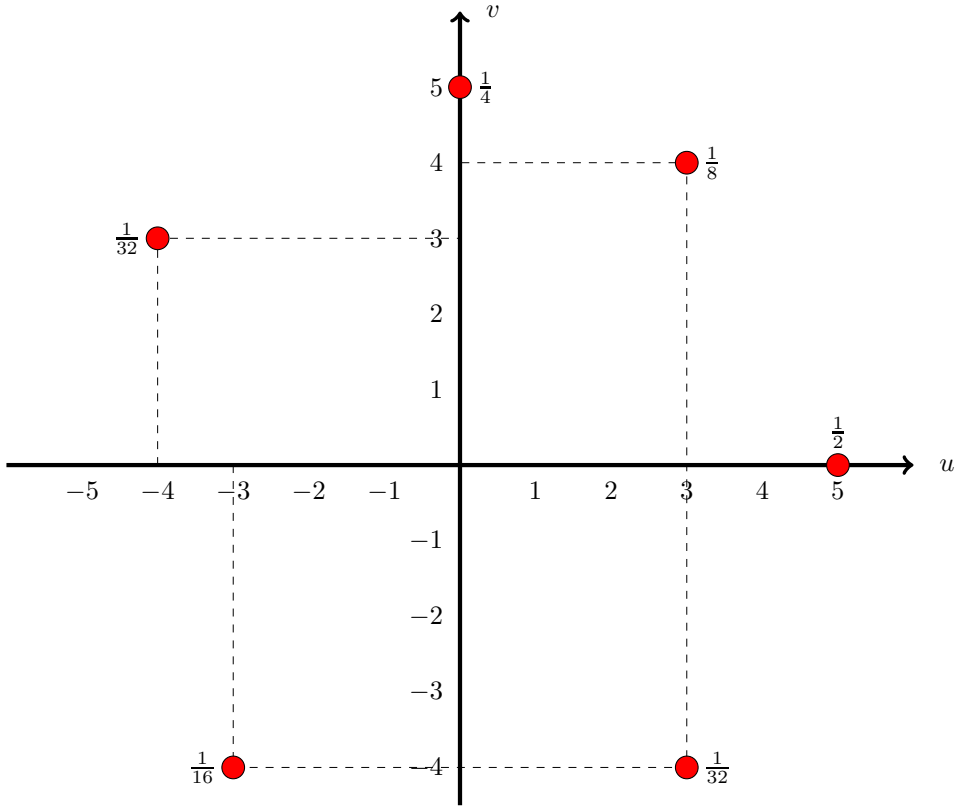
If random variables X and Y have joint probability mass function $p_{X,Y}(u, v)$ shown below (each red dot has integer coordinates), then what is the variance of $3(X^2 + Y^2) - 1$?



(a) 0

(b) 3

(c) 4

(d) 5

(e) 9

(f) 16

(g) 25

(h) 5/2

(i) 3/2

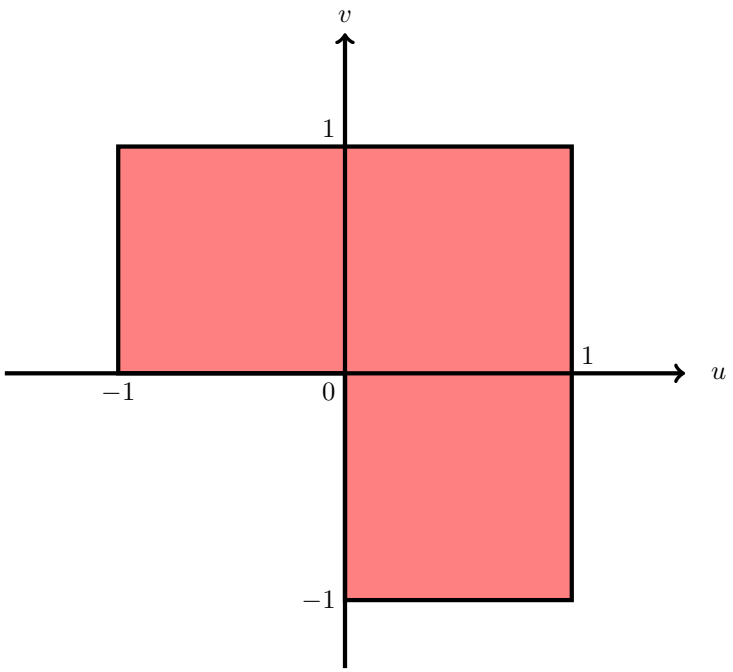
(j) 9/4

(k) 4/9

(l) 50

(m) None of these

Suppose X and Y are random variables whose joint probability density function is uniform in the red region shown below, and zero elsewhere. What is the expected value of XY ?



(a) $-1/12$

(b) $1/12$

(c) $1/6$

(d) $-1/6$

(e) $1/3$

(f) $-1/3$

(g) $1/2$

(h) $-1/2$

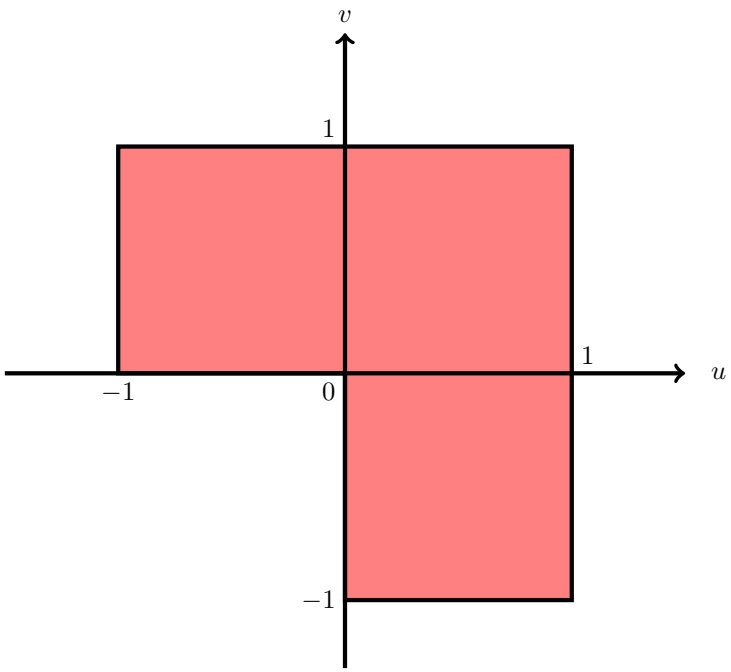
(i) $2/3$

(j) $-2/3$

(k) 0

(l) None of these

Suppose X and Y are random variables whose joint probability density function is is uniform in the red region shown below, and zero elsewhere. What is the variance of X ?



(a) 11/36

(b) 11/18

(c) 1/9

(d) 1/3

(e) 2/3

(f) 5/36

(g) 5/18

(h) 5/9

(i) 1/36

(j) 1/6

(k) 1/4

(l) None of these