78. A function $f(x, y)$ is given by

$$f(x,y) = \begin{cases} k(x+2y) & \text{if } 0 < y < 1 \text{ and } 0 < x < 2 \\ 0 & \text{otherwise.} \end{cases}$$

(a) Find the value of k that makes $f(x, y)$ a joint PDF.

(b) Find the marginal distribution of X.

(c) Find the joint cumulative distribution function (joint CDF) of X and Y.