77. A random vector (X, Y) is uniformly distributed according to the joint probability density function (PDF)

$$f(x,y) = \begin{cases} \frac{1}{4} & -1 < x < 1, -1 < y < 1 \\ 0 & \text{otherwise.} \end{cases}$$

For each of the following sketch support and the area of integration, and find the corresponding probabilities.

(a) $P(X^2 + Y^2 < 1)$

(b) $P(2X - Y > 0)$

(c) $P(|(X + Y)| < 2)$