Problem.

Let (X, Y) be jointly uniform over the region

$$A = \{(x, y) \mid 0 < x^2 < y < 4\} \subset \mathbb{R}^2.$$

What is $E[Y \mid X = 1]$? Hint: Note that $f(x, y) = c$ for $(x, y) \in A$. What is c?

□