Quiz Problem 11

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?

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