Consider random variables $X$ and $Y$ given by the joint density

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

Find $\text{Cov}(X, Y)$.
In the same situation, find $E(X|Y)$.

[(optional question for extra credit)]: If $Z_1, Z_2$ are independent standard normal random variables, and $X = 3Z_1 + 4Z_2, Y = 3Z_1 - 4Z_2$, find $\rho(X, Y)$. Do not use any integrals or derivatives.