Exercise 10.1. The joint probability mass function of the random variables (X, Y) is given by the following table:

Y

	0	1	2
1	0	$\frac{1}{9}$	0
2	$\frac{1}{3}$	$\frac{2}{9}$	$\frac{1}{9}$
3	0	$\frac{1}{9}$	$\frac{1}{9}$

X

(a) Find the conditional probability mass function of X given $Y = y$.
(b) Find the conditional expectation $E[X|Y = y]$ for each of $y = 0, 1, 2$.

Exercise 10.9. Let the joint density function of (X, Y) be

$$f(x, y) = \frac{1}{y}e^{-x/y}e^{-y} \quad \text{for } 0 < x < \infty \text{ and } 0 < y < \infty.$$

(a) Find $f_Y(y)$ and $f_{X|Y}(x|y)$. Compute $E[Y]$.
(b) Find the conditional expectation $E[X \mid Y]$.
(c) Use parts (a) and (b) to compute $E[X]$.