

**Corrections in *Probability Through Problems*
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page 190, Problem 10.44

Replace $x^2 + y^2 \leq 1$ by $-2 \leq -y \leq 2x \leq 2$

page 190, Problem 10.46

Replace $f_{X,Y}(x, y) = K(x + y^2)$ by $f_{X,Y}(x, y) = K(x^2 + y^2)$

page 194, Hint 10.46

Add sentence:

Alternatively, $E(X|Y)$ can be found without any calculations by considering the symmetry of the problem.

page 209, Solution 10.42

Replace $f_Y(x)$ by $f_Y(y)$ in the first displayed formula.

page 210, Solution 10.43

Replace $f_Y(x)$ by $f_Y(y)$ in the first displayed formula.

page 210, Solution 10.44

Replace Solution 10.44 by:

First we compute the density of Y ,

$$\begin{aligned} f_Y(y) &= \int_{-\infty}^{\infty} f_{X,Y}(x, y) dx \\ &= K \int_{-y/2}^1 (2x + y) dx = K(1 + y + y^2/4) \end{aligned}$$

if $-2 \leq y \leq 2$, and zero otherwise. Next, we obtain

$$h(x|y) = \frac{f_{X,Y}(x, y)}{f_Y(y)} = \frac{2x + y}{1 + y + y^2/4}$$

if $-2 \leq -y \leq 2x \leq 2$, and zero otherwise. Finally,

$$E(X|Y) = \int_{-\infty}^{\infty} xh(x|Y) dx = \int_{-Y/2}^1 \frac{2x^2 + xY}{1 + Y + Y^2/4} dx = \frac{2}{3} - \frac{1}{6}Y.$$