Page 105, last line. On the right-hand side of the inequality, $W(k)$ should be $W(t_k)$.

Page 113, equation (3.7.4). There are two places where the exponent αm should be αt. The equation should be

$$\mathbb{E}e^{-\alpha\tau_m} = \int_0^\infty e^{-\alpha t} f_{\tau_m}(t)\,dt = \int_0^\infty \frac{|m|}{t\sqrt{2\pi t}} e^{-\alpha t - \frac{m^2}{2t}}\,dt \text{ for all } \alpha > 0. \tag{3.7.4}$$

Page 116, line 12. The equation should be

$$f_{\tau_m}(t) = \frac{|m|}{t\sqrt{2\pi t}} e^{-\frac{m^2}{2t}}.$$

Page 118, line 1. Change m to n. The text should be "... as the number n of partition points ...."

Page 119, line 16. Change $h(y)$ to $f(y)$, so the equation is $g(x) = \int_0^\infty f(y)p(\tau, x, y)\,dy$.

Pages 122 and 123, Exercise 3.9. Replace with the following exercise:

Exercise 3.9 (Laplace transform of first passage density; solution provided by Kaiping Chen and Ji Li). Let $m > 0$ be given and define

$$f(t) = \frac{m}{t\sqrt{2\pi t}} \exp\left\{-\frac{m^2}{2t}\right\}.$$

According to (3.7.3) in Theorem 3.7.1, $f(t)$ is the density of the first passage time

$$\tau_m = \min\{t \geq 0; W(t) = m\},$$

where W is a Brownian motion without drift. Let

$$g(\alpha) = \int_0^\infty e^{-\alpha t} f(t)\,dt, \quad \alpha > 0,$$

be the Laplace transform of the density $f(t)$. This problem verifies directly, without resort to the probabilistic arguments of this chapter, that

$$g(\alpha) = e^{-m\sqrt{2\alpha}}, \quad \alpha > 0,$$

which is the formula derived in Theorem 3.6.2.

(i) For positive numbers a and b, define

$$I(a,b) = \int_0^\infty \exp\left\{-a^2x^2 - \frac{b^2}{x^2}\right\} dx.$$

Make the change of variable $y = b/(ax)$ to show that

$$\begin{aligned} I(a,b) &= \frac{b}{a}\int_0^\infty \frac{1}{y^2} \exp\left\{-a^2y^2 - \frac{b^2}{y^2}\right\} dy \\ &= \frac{b}{a}\int_0^\infty \frac{1}{x^2} \exp\left\{-a^2x^2 - \frac{b^2}{x^2}\right\} dx. \end{aligned}$$