Solution 30. (1) *By using Remark 7.1, we may write* $S_t = \exp(L_t)$ *with*

$$
\begin{aligned}
L_t &= bt - \tfrac{1}{2}\sigma^2 t + t\int_{|z|\le 1} (\log(1+z) - z)\nu(\mathrm{d}z) \\
&\quad + \sigma B_t + \int_0^t \int_{|z|>1} \log(1+z)\mathcal{N}(\mathrm{d}s,\mathrm{d}z) + \int_0^t \int_{|z|\le 1} \log(1+z)\widetilde{\mathcal{N}}(\mathrm{d}s,\mathrm{d}z).
\end{aligned} \tag{A.123}
$$

The last two integrals are well-defined because $\log(1+z) \sim_0 z$ *and* ν *is a Lévy measure.*

(2) *We get*

$$
\begin{aligned}
\mathrm{d}f(L_t) &= f'(L_t)b\mathrm{d}t - \frac{1}{2}\sigma^2 f'(L_t)\mathrm{d}t + \int_{|z|\le 1}(\log(1+z) - z)\nu(\mathrm{d}z)f'(L_t)\mathrm{d}t + \sigma f'(L_t)\mathrm{d}B_t \\
&\quad + \frac{1}{2}f''(L_t)\sigma^2\mathrm{d}t + \int_{|z|>1}[f(L_{t^-} + \log(1+z)) - f(L_{t^-})]\mathcal{N}(\mathrm{d}t,\mathrm{d}z) \\
&\quad + \int_{|z|\le 1}[f(L_{t^-} + \log(1+z)) - f(L_{t^-})]\widetilde{\mathcal{N}}(\mathrm{d}t,\mathrm{d}z) \\
&\quad + \int_{|z|\le 1}[f(L_{t^-} + \log(1+z)) - f(L_{t^-}) - \log(1+z)f'(L_{t^-})]\mathrm{d}t\nu(\mathrm{d}z)
\end{aligned} \tag{A.124}
$$

(3) *Applying it to* $f = \exp$ *and simplifying, we get*

$$
\mathrm{d}S_t = S_{t^-}\Big[b\mathrm{d}t + \sigma\mathrm{d}B_t + \int_{|z|>1} z\mathcal{N}(\mathrm{d}t,\mathrm{d}z) + \int_{|z|\le 1} z\widetilde{\mathcal{N}}(\mathrm{d}t,\mathrm{d}z)\Big] = S_{t^-}\mathrm{d}X_t. \tag{A.125}
$$

Solution 31. *The case treated in (7.7) corresponds to* $\nu_i = \lambda_i\delta_1$, *where* $(i \in \{1,2\})$, *hence* $\phi(z) = \log(\lambda_1/\lambda_2)$ *and we obtain*

$$
\nu_1(\mathbb{R}) - \nu_2(\mathbb{R}) = \lambda_1 - \lambda_2, \qquad \sum_{0<s\le t}\phi(\Delta X_s) = \log(\lambda_1/\lambda_2)\sum_{\substack{0<s\le t\\(\Delta X_s\neq 0)}} 1 = \log(\lambda_1/\lambda_2)N_t. \tag{A.126}
$$