PROOF OF FORMULA 2.313.1

$$\int \frac{dx}{a + be^{mx}} = \frac{1}{am}\left[mx - \ln(a + be^{mx})\right]$$

Let $t = a + be^{mx}$ to obtain

$$\int \frac{dx}{a + be^{mx}} = \frac{1}{m}\int \frac{dt}{t(t - a)}.$$

The partial fraction decomposition

$$\frac{1}{t(t - a)} = \frac{1}{a}\left(\frac{1}{t - a} - \frac{1}{t}\right),$$

gives the result.