Exercise 1-9

Wednesday, 22 April 2020 14:00

a)

$$100\left(\frac{X - X_i}{X_S - X_i}\right) = 100\left(\frac{aT + b - a\cdot 0 - b}{a\cdot 100 + b - a\cdot 0 - b}\right)$$

$$= 100\left(\frac{aT}{100a}\right)$$

$$= \frac{100}{100}\frac{a}{a}T = T \qquad \square$$

b)

$$100\left(\frac{\ln(X/X_i)}{\ln(X_S/X_i)}\right) = 100\,\frac{\ln(X) - \ln(X_i)}{\ln(X_S) - \ln(X_i)}$$

$T = a\ln(X) + b$

$T - b = a\ln(X)$

$\frac{T-b}{a} = \ln(X)$

$X = e^{\frac{T-b}{a}}$

$$= 100\left(\frac{\frac{T-b}{a} - \frac{0-b}{a}}{\frac{100-b}{a} - \frac{0-b}{a}}\right)$$

$$= 100\,\frac{\left(\frac{T}{a}\right)}{\left(\frac{100}{a}\right)}$$

$$= T \qquad \square$$