Python seminar Homework for Chap. 3.5

1. Please plot a temperature function proposed by Thornton and Lessem (1978) which is frequently used for temperature dependency of prey consumption by fish. The function is defined as a multiply of upward and downward functions.

fc(T)=gcta*gctb

where

$$tt5=\frac{1}{te2\text{-}te1}, \quad t5=tt5\times\ln\frac{xk2\times(1\text{-}xk1)}{xk1\times(1\text{-}xk2)}, \quad t4=e^{t5\times(T\text{-}te1)},$$

$$tt7=\frac{1}{te4\text{-}te3}, \quad t7=tt7\times\ln\frac{xk3\times(1\text{-}xk4)}{xk4\times(1\text{-}xk3)}, \quad t6=e^{t7(te4\text{-}T)},$$

$$gcta=\frac{xk1\times t4}{1+xk1(t4\text{-}1)}, \quad gctb=\frac{xk4\times t6}{1+xk4\times(t6\text{-}1)}$$

Now, please assume

te1=5.0, te2=10.0, te3=26.0, te4=28.0,
xk1=0.1, xk2=0.8, xk3=0.98, xk4=0.2

and draw the figure of the function. To understand the meaning of the function, please draw gcta, gctb, and f(T) separately as shown in the following figure.