$$\frac{\bar{T}_w - \bar{T}_{m,o}}{\bar{T}_w - \bar{T}_{m,i}} = e^{-NTU} = e^{-\frac{\bar{h} A_s \sim \pi DL}{\dot{m} c_p}}$$

$$= e^{-\left(\frac{23000 \times \pi \times 0.02 \times 10}{2.5 \times 4186}\right)} = 0.251$$

$$\frac{\bar{T}_w - 30}{\bar{T}_w - 20} = 0.251 \Rightarrow \bar{T}_w = 33.3^{\circ}C$$