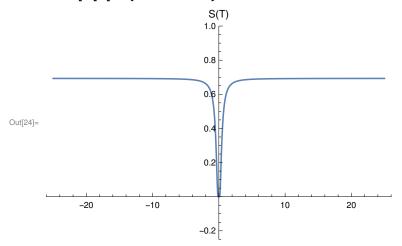
In[9]:=

1c) Plot the entropy vs T

In[10]:=
$$k = 1$$
;
 $\epsilon = 1$;

$$In[16]:= S[T_{]} := k * Log[1 + Exp[-\epsilon/(k * T)]] + \frac{\epsilon * Exp[-\epsilon/(k * T)]}{T * (1 + Exp[-\epsilon/(k * T)])}$$

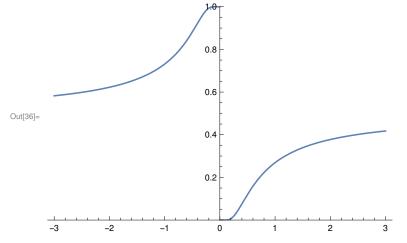
 $\label{eq:local_state} \text{Plot}\big[\textbf{S}\big[\textbf{T}\big], \ \big\{\textbf{T}, \ -25, \ 25\big\}, \ \text{PlotLabel} \ \rightarrow \text{"S}(\textbf{T})\text{", PlotRange} \ \rightarrow \big\{-.25, \ 1\big\}\big]$



1d) Plot S(T) vs U(T). Explain maximum of U.

$$\ln[25]:= U[T_{-}] := \frac{\epsilon * Exp[-\epsilon/(k * T)]}{(1 + Exp[-\epsilon/(k * T)])}$$

 $\label{eq:loss_loss} \mathsf{In}[36] \coloneqq \ \mathsf{Plot} \big[\mathsf{U} \big[\mathsf{T} \big] \,, \, \big\{ \mathsf{T} \,, \, -3 \,, \, 3 \big\} \,, \,\,\, \mathsf{PlotRange} \to \big\{ \mathsf{0} \,, \, \, \mathsf{1} \big\} \big]$



$$\label{eq:local_local_local_local_local_local} \begin{split} & \text{local_local$$

U(T)



