$ln[10] = D[8 (8.53537)^2 (Exp[-L/(2*8.53537)] - 1 + L/(2*8.53537)), L]$

Out[10]= $582.82 \ \left(0.0585798 - 0.0585798 \ e^{-0.0585798 \ L}\right)$

 $ln[11]:= % /. L \rightarrow 33.14517$

Out[11]= 29.2432