W2-11-2 The total differential of a function S 2

Consider the function $S = S(U, V) = -2U^3 - U^{-2} - 3V^5 + 8V$. Calculate for which value of U the function S has an extreme value. $U_{extreme}$ = ...

For an extreme value of S, dS should be zero.
This is only possible if and only if $\left(\frac{\partial S}{\partial U}\right)_V = 0$
$-6U^2 + 2U^{-3} = 0 \rightarrow U_{extreme} = \left(\frac{1}{3}\right)^{\frac{1}{5}}$.