

Kittel thermo physics.

$$2.1. a) g(U) = C U^{3N/2}$$

$$\sigma = \ln g = \ln C + \frac{3N}{2} \ln U.$$

$$\frac{1}{T} = \frac{d\sigma}{dU} = \frac{3N}{2} \frac{1}{U}$$

$$\Rightarrow \boxed{U = \frac{3N}{2} T.}$$

$$(b) \quad \frac{d^2\sigma}{dU^2} = -\frac{3N}{2} \frac{1}{U^2}.$$

For  $N$ ,  ~~$\sigma$~~  ~~is~~ ~~not~~ ~~negative~~,  $\rightarrow$   
this is clearly negative.

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