Class 30 T3 B.1, B.4, B.7, B.8, B.9

1) $\Omega = k \ln(3.8 \times 10^{250})$

$= k\left[250 \ln(10) + \ln 3.8\right]$

$645 \qquad 1.3$

$= k[646]$

4) using Stat Mech → just look at Ω_A

5/15 → 77 558 760 Ω → $\ln = 18.2$

↳ $\frac{(15+15)!}{15!\,15!} = \frac{29!}{15!\,14!}$ ✓ math

50/100 → 3.63781×10^{71} Ω → $\ln = 164.8$

↳ $\frac{149+100}{100!\,149!}$ ✓ math

7 $\frac{dS}{dq} = \frac{1}{T}$, $T = \frac{dq}{dS} = \frac{35\,J}{.1\,J/K} = 350\,K$

8 $dS = \frac{dq}{T} = \frac{10\,J}{293} = 3.4 \times 10^{-2}\,J/K$

9 $T = \frac{dq}{dS} = \frac{\varepsilon}{32.9\,k_B}$

$(338.1 - 305.2)\,k_B$

$\frac{T k_B}{\varepsilon} = \frac{1}{32.9} = .0304$ ← unitless