Quiz 3

a) The concentration of end-groups is proportional to

$$\phi_e \sim \frac{2}{M}$$

The first term Γ_∞ corresponds to the $M \to \infty$ limit.

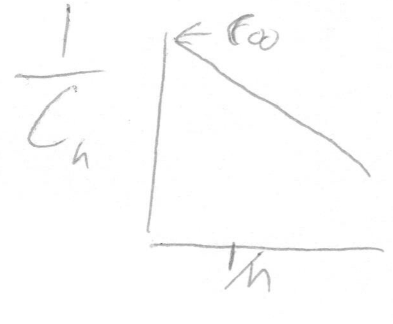
The surface tension in the absence of chain ends.

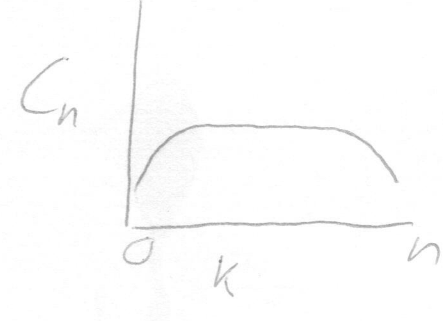
b) The entropy proposition seems convoluted. I have no idea why chain stiffness would impact end group segregation and entropy doesn't help.

I suppose in the limit of rods, only one end could be at the surface so $\phi_{e_{rods}} \sim \frac{\phi_{e_{coils}}}{2}$ and there could be a gradient from flexible to rods. ~~that a should probably be $\frac{1}{l_p}$ not l_p in the x axis.~~

c) $$C_n = \frac{\langle R_n^2 \rangle}{\langle R_{ideal}^2 \rangle} = \frac{\langle R_n \rangle}{n_k l_k^2} = \frac{L\, l_{ep}}{L\, l_k} = \frac{l_{ep}}{l_k}$$

when $n \Rightarrow \infty$ C_∞





d) He predicts a new dependence of the chain persistence impact on the molecular weight dependence of surface tension

$$\gamma \sim kT\left(\Gamma_\infty - \frac{2A}{N}\right)$$

So $A(l_p)$. but if $l_p \; \frac{1}{n} \sim \frac{K_1}{n} + K_2$

this becomes some function of n so he doesn't have an inverse relationship then.

Any case eqn (3) is wrong.

Actually a need to select a chain stiffness but never really measures l_p for his result.

(e)

low mw → low lp
for low lp you get more endgroups segregation
so it is consistent with his propositions
and with experiment.