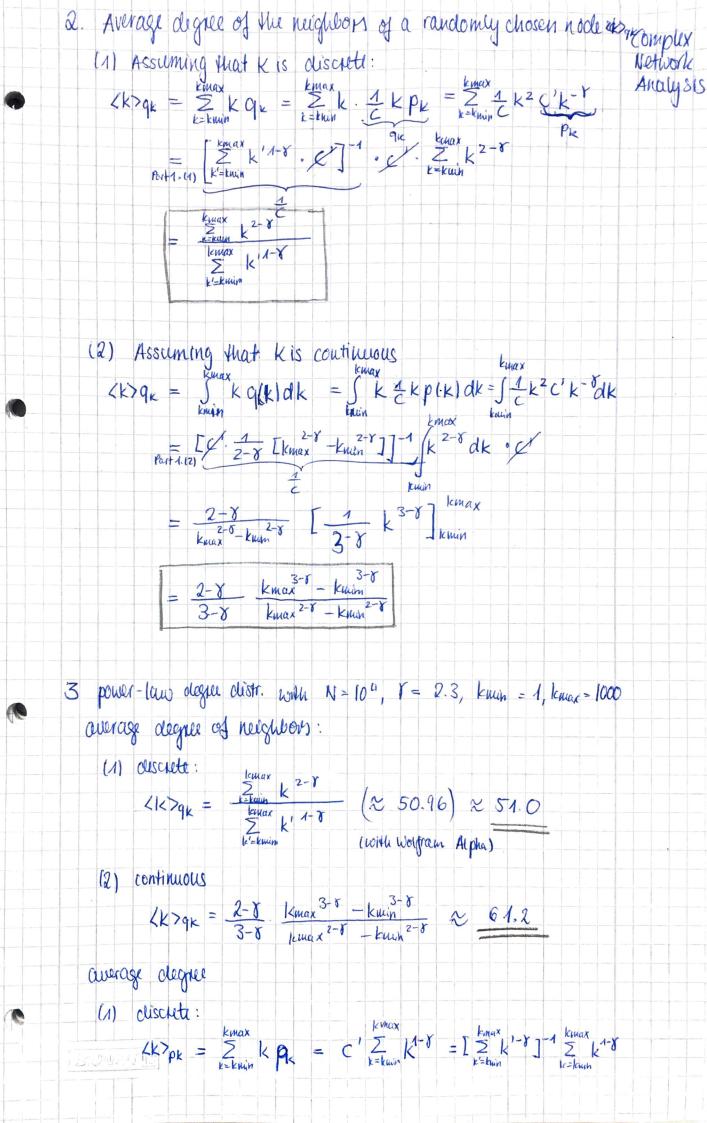
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Problem 4-2 Friendship Paradoxon
1. Probability that a node at one of a randomly chosen
    node's ends has degree k
      9k = 1.k.pk
    (1) Assuming that k is discreti:
       Normalisation condition for a probability density function:
  (2) Assuming that kis continuous:
        Normalisation Condition:
  = \int_{\mathbb{R}} k \cdot C' \cdot k^{-\gamma} dk \left[ power[aw: p(k) = C' k^{-\gamma} dk \right]^{-1} \right]
= \lim_{k \to \infty} k \cdot C' \cdot k^{-\gamma} dk \left[ power[aw: p(k) = C' k^{-\gamma} dk \right]^{-1} \right]
              = C' J. K1-Y dk
              = C' \cdot \left[ \frac{1}{2-8} k^{2-8} \right]^{k \text{max}}
              = C 2-8 [kmux2-8 - kmin2-7]
              = [ Smax k-8 clk] -1. 1 [kmax2-8-kmin 2-8]
              = [ 1 k-y+1 kmax 1/2 [kmax2-r-kmax2-r]
             =\frac{1-8}{2-8} \cdot \frac{\text{kmux}^2-8 - \text{kmin}^2-8}{\text{kmin}^{4-8} - \text{kmin}^{4-8}}
    Here we also assume that pk = 0 for k>kmax and k< kmin.
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(2) continuous

$$k_{max}$$
 $\langle k \rangle p_{k} = \int_{k_{min}} k p(k) dk = \int_{k_{min}} k \cdot C' \cdot k^{-8} dk$ 

$$= \left[ \int_{\text{Emin}}^{\text{kmax}} k^{-\delta} dk \right]^{-1} \int_{\text{kuir}}^{\text{kmax}} k^{1-\delta} dk$$

$$= \left[\frac{1}{1-8} \left( \left( \frac{1}{2-8} \left( \frac{1}{2-8} \left( \frac{1}{2-8} \left( \frac{1}{2-8} \left( \frac{1}{2-8} \left( \frac{1}{2-8} \right) \right) \right) \right) \right] \right]$$

4. Nodes with lower degrees an on average more likely to be connected to high degree nodes than other low degree nodes, which is also explained by the Friendship paradoxon.