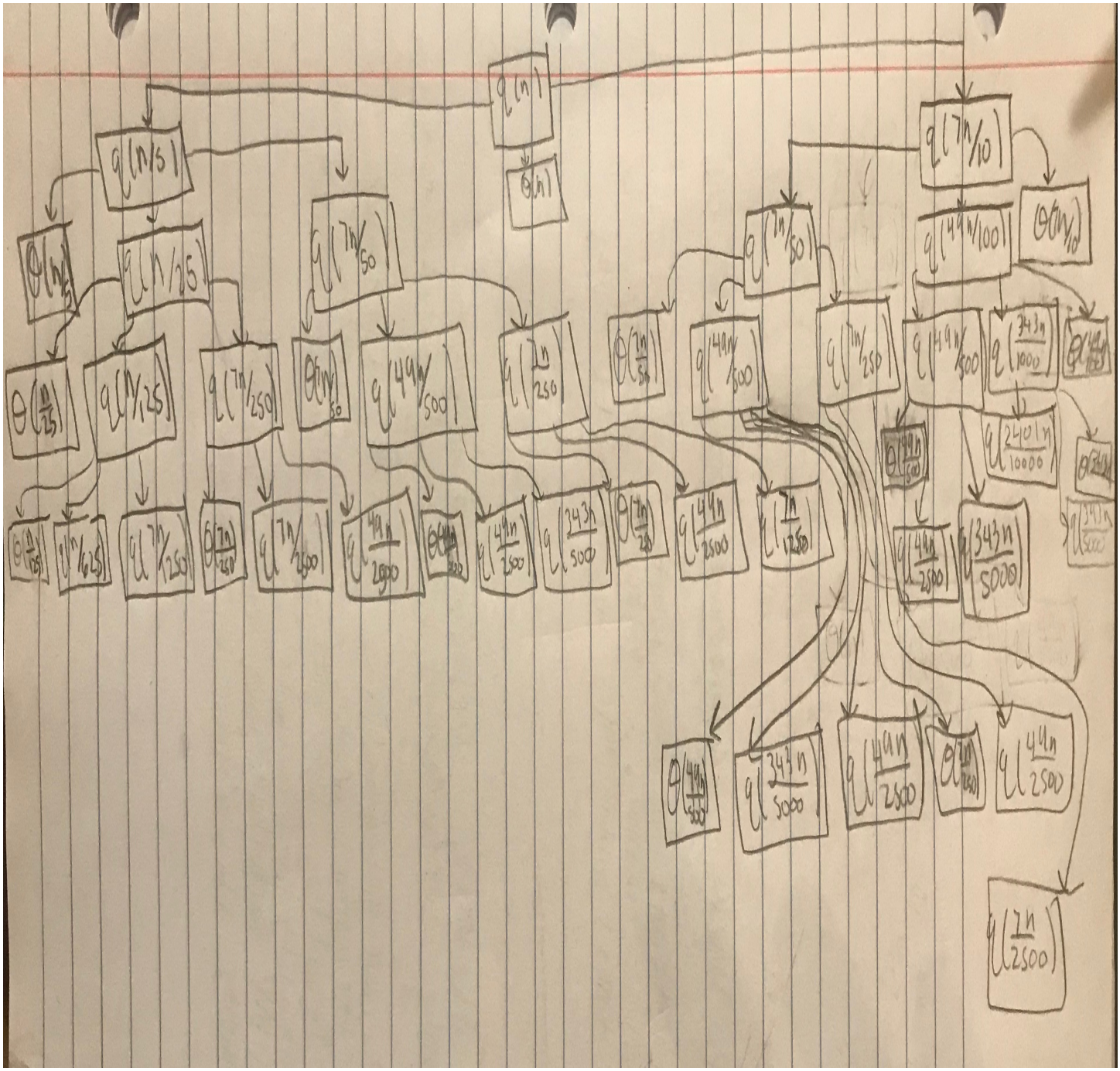

Above is the recursive call tree for part three b, the answers are in the hw5.txt file

$$\sum_{i=0}^{\log_{\frac{10}{9}}\left(\frac{n}{10}\right)} n\left(\frac{9}{10}\right)^i = n \sum_{i=0}^{\log_{\frac{10}{9}}\left(\frac{n}{10}\right)} \left(\frac{9}{10}\right)^i$$

$$\sum_{i=0}^{k-1} ar^i = a\left(\frac{1-r^k}{1-r}\right) \qquad a = 1 \quad r = \left(\frac{9}{10}\right)$$

$$n\left(\frac{1-\left(\frac{9}{10}\right)^{\log_{10/9}\left(\frac{n}{10}\right)}}{1-\left(\frac{9}{10}\right)}\right)$$

$$\frac{n - n\left(\frac{9}{10}\right)^{\log_{10/9}\left(\frac{n}{10}\right)}}{\frac{1}{10}}$$

$$10n - 9n\left(\frac{9}{10}\right)^{\log_{10/9}\left(\frac{n}{10}\right)}$$

$$O(n)$$

Above is the work for the summation of the run time of the algorithm, answers are in the hw5.txt file explaiing solution