

Title - Asymptotic bounds

Question 1:

What is the number of digits in 2^{100} ?

Question 2:

What is the approximate factor – how the number length grows or shrinks as it is rewritten from decimal into binary?

Question 3:

Find the following limit:

$$\lim_{n \rightarrow \infty} \log_{10} \frac{a_4 n^4 + a_3 n^3 + a_2 n^2 + a_1 n + a_0}{b_3 n^3 + b_2 n^2 + b_1 n + b_0}.$$