

- (a) Let a_1, a_2, \dots be a sequence of real numbers such that $a_1 = 1$ and $a_{n+1} > \frac{3}{2}a_n$ for all n . Prove that the sequence

$$\frac{a_n}{\left(\frac{3}{2}\right)^{n-1}}$$

has a finite limit or tends to infinity.

- (b) Prove that for all $\alpha > 1$ there exists a sequence a_1, a_2, \dots with the same properties such that

$$\lim_{n \rightarrow \infty} \frac{a_n}{\left(\frac{3}{2}\right)^{n-1}} = \alpha.$$