1. Is it true that if x_n is convergent and y_n is divergent , then $x_n y_n$ is divergent? If yes, provide a proof, if not provide a counter example. (adapted from Feher)
2. Calculate the limit of $(2^n - n)^{1/n}$ (Adapted from Feher).
3. Prove the squeeze lemma sometimes referred to as the sandwich theorem.
4. Prove that $\limsup x_n + y_{n_n} \leq \limsup x_n + \limsup y_n$(Workshop problems)
5. A sequence a_n has only one convergent subsequence that converges to a. Is it necessarily true that $\lim_{n\to\infty} a_n = a$? If so, provide a proof, if not provide a counterexample.(Adapted from 2)
6. Prove that $\frac{(n^2+100n+86)\sin n^3}{n^2+n+1}$ has a convergent subsequence. (Adapted from Source 2)