1 First

Theorem 1.1. *If a_n is a monotonically increasing sequence bounded from above, then it is convergent, and in fact* $\lim_{n\to\infty} a_n = \sup\{a_n : n \in \mathbb{N}\}$.

Theorem 1.2 (Bolzano–Weierstrass)**.** *Every bounded sequence has a convergent subsequence.*

Boundedness is a necessary condition, because for example for all subsequences a_{n_i} of the sequence $a_n = n$, we have $\lim_{i\to\infty} a_{n_i} = \infty$.

Proof. Let a_n be a bounded sequence. Because of Theorem 1.1, it's enough to show that a_n has a monotonic subsequence. [...] □

$$\begin{aligned}\int \cos^n x \, dx &= \int \underbrace{\cos x}_{f'} \underbrace{\cos^{n-1} x}_{g} \, dx \\ &= \underbrace{\sin x}_{f} \underbrace{\cos^{n-1} x}_{g} - \int \underbrace{\sin x}_{f} \underbrace{(n-1)\cos^{n-2} x \cdot (-\sin x)}_{g'} \, dx\end{aligned}$$

The above uses `\underbrace{\cos x}_{f'}` as an example.

2 Second

Name	Erdős number	Bacon number	Erdős–Bacon number
Albert M. Chan	3	1	4
Donovan Hare	2	2	4
Nicholas Metropolis	2	2	4
Steven Strogatz	3	1	4

Table 1: People with the highest Erdős–Bacon number

Document styles

type of doc	name of style
article	`article`, `amsart`
book	`book`
report	`report`
presentation	`beamer`
letter	`letter`

Table 2: A floating table similar to Table 1