Math 128 : Calculus 2 for the Sciences **Winter 2016**

Lecture 22: February 29, 2016

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22.1 Lengths of Polar Curves

If $r = f(\theta)$, $\alpha \leq \theta\beta$

$$L = \int_{\alpha}^{\beta} \sqrt{r^2 + (\frac{dr}{d\theta})^2}$$

22.2 Sequences

A sequence is a list of numbers written in a specific order :

$$a_1, a_2, a_3, \ldots, a_n$$

Notation : $\{a_n\}_{n=1}^{\infty} = \{a_n\} = \{a_1, a_2, a_3, \ldots\}$

Some sequences are explicitly defined :

$$\left\{\frac{n}{n+1}\right\} = \left\{\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \ldots\right\}$$

Others are defined recursively :

$$f_1 = 1, f_2 = 1, f_n = f_{n-1} + f_{n-2},\ n \geq 3$$

Theorem 22.1 *If* $\lim_{x\to\infty} f(x) = L$ *and* $f(n) = a_n$*, then* $lim_{n\to\infty} a_n = L$
This theorem tells us that limits of sequences obey the same theorems as limits of functions

End of Lecture Notes
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