MATHEMATICS

Monday October 17 2016

Fourth Exercise Class

1) Verify that $a_n = 3 - \frac{1}{n^2+1}$ approaches $L = 3$ for $n \to +\infty$.

2) Verify that $a_n = (-1)^n$ does not admit limit.

3) Verify whether the sequence $a_n = \left(-\frac{1}{n}\right)_{n=1}^{\infty}$ is bounded from below, bounded from above, or bounded.

3) Verify whether the sequence $a_n = \left(1 - n^2\right)_{n=1}^{\infty}$ is bounded from below, bounded from above, or bounded.

4) Study domain, sign and axis-intercepts of the following functions

- $y = \frac{5\cos x}{1+2\cos x}$

- $y = \frac{\ln x}{\sqrt{1+\cos x}}$

- $y = \frac{\ln(|\sin x + \cos x|)}{3^{2\sin x} - 4 \cdot 3^{\sin x} + 3}$

- $y = \frac{\ln(1-\sin^2 x)}{x e^{\sin x}}$

- $y = \frac{\log(1+x^2)}{\sin x - x}$