MATHEMATICS

Self–Evaluation Test

Lastname ..... Name .....

1) *(15 p.ts)* Study the function $f(x) = \frac{\ln x}{1-\ln x}$: domain,sign, limits, asymptotes, maximum and minimum points and graph.

2) *(6 p.ts)* Write the Taylor polinomial of degree 4 for $f(x) = \log(x+1)$ in $x = 0$ and use it to find an approximation of $\log 2$.

3) *(3 p.ts)* Can we apply Weiestrass' Theorem and Rolle's Theorem to $f(x) = |x-1|$ in $[-2, 2]$? Motivate your answer.

4) *(3 p.ts)* Evaluate $\lim_{n\to+\infty} \frac{(-1)^n}{n} \cos\left(\frac{1}{n}\right)$.

5) *(3 p.ti)* Given the set $B = \left\{\frac{1}{5n} | n \in \mathbb{N}\right\} \cup \{0\}$, establish if it is a closed set or not. Motivate your answer.