

MA 214 Short notes

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1 Framework

1. A method approximates to t sig digits if $\left| \frac{x-x^*}{x} \right| \leq 5 \times 10^{-t}$
2. Relative error $\left| \frac{x-x^*}{x} \right| \approx \left| \frac{x-x^*}{x^*} \right|$
3. Loss of sig digits is caused by subtraction of nearly equal quantities, or division by small numbers
4. Condition: Sensitivity to changes in x , $\frac{\Delta f/f}{\Delta x/x} \approx \frac{f'(x)x}{f(x)}$
5. IVT for functions: $f[a, b] \rightarrow \mathbb{R}$, $\exists \xi \in [a, b] \mid \sum f(x_i)g_i = f(\xi) \sim g_i$