Seminario Un Paso

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Calculemos $\frac{y_{n+1}}{y_n}$ para luego ver cuando está acotado.

$$y_{n+1} - y_n = \frac{h}{2}(f_n + f_{n+1}) + \frac{h^2}{12}(f_n^{(1)} - f_{n+1}^{(1)})$$

Sustituimos $f_n^{(k-1)} = \lambda^k y_n$

$$y_{n+1} - y_n = \frac{h}{2}(\lambda y_n + \lambda y_{n+1}) + \frac{h^2}{12}(\lambda^2 y_n - \lambda^2 y_{n+1})$$

$$y_{n+1}(1 - \frac{\lambda h}{2} + \frac{\lambda^2 h^2}{12}) = y_n(1 + \frac{\lambda h}{2} + \frac{\lambda^2 h^2}{12})$$

$$\frac{y_{n+1}}{y_n} = \frac{1 + \frac{\lambda h}{2} + \frac{\lambda^2 h^2}{12}}{1 - \frac{\lambda h}{2} + \frac{\lambda^2 h^2}{12}}$$

Sustituimos $\lambda h = \bar{h}$

$$\frac{y_{n+1}}{y_n} = \frac{1 + \frac{\bar{h}}{2} + \frac{\bar{h}^2}{12}}{1 - \frac{\bar{h}}{2} + \frac{\bar{h}^2}{12}}$$