

Painleve I

Following the paper by Costin and Dunne 1904.11593.

ToDo

- Create the Series for the Painleve I
- Borel Transform

Creating the Series

$$y''(x) - 6y^2(x) + x = 0$$

- want smooth real solution for large x
- Ecalle time $t = \frac{(24x)^{5/4}}{30}$
- $y(x) = -\sqrt{\frac{x}{6}}(1 + h(t))$
- now for $h(t)$ we have

$$\ddot{h}(t) + \frac{1}{t}\dot{h}(t) + h(t) \left(1 + \frac{1}{2}h(t)\right) - \frac{4}{25t^2} (1 + h(t)) = 0$$