

Exercises

23.12 [1RQ] Note: Exercise 4, written exam 9 July 2011. Show that the Cauchy problem

$$\begin{cases} y'(x) = y(x)(y(x) - x^2) \\ y(2) = 1 \end{cases}$$

admits a single solution $y = y(x)$, defined on all of \mathbb{R} and such that

$$\lim_{x \rightarrow -\infty} y(x) = +\infty \quad , \quad \lim_{x \rightarrow \infty} y(x) = 0 \quad .$$