



Differential Equations

Quiz #8

Name: _____

Question 1. The Cauchy problem $x'(t) = |x(t)|$ (for $t \in \mathbb{R}$) with $x(0) = 1$ has locally:

- no solution ☐
- a unique solution ☐
- more than one solution ☐
- one cannot tell a priori ☐

Question 2. Same question with the Cauchy problem $x'(t) = x^3(t)$ on \mathbb{R} with $x(0) = 1$:

- no solution ☐
- a unique solution ☐
- more than one solution ☐
- one cannot tell a priori ☐

Question 3. Same question with $x'(t) = \lfloor x(t) \rfloor + e^t$ on \mathbb{R} (floor function, in French *partie entière*) and $x(0) = 1$:

- no solution ☐
- a unique solution ☐
- more than one solution ☐
- one cannot tell a priori ☐

Question 4. Same question with $x(t)x'(t) + t = 0$ on \mathbb{R} and $x(1) = 0$:

- no solution ☐
- a unique solution ☐
- more than one solution ☐
- one cannot tell a priori ☐