

1. Consider the initial value problem for first order differential equation

$$\begin{aligned}\frac{dx}{dt} &= 1 + x^2 \\ x(0) &= 0\end{aligned}$$

- (a) Solve this initial value problem explicitly, by separation of variables.
(b) Work out the first 4 steps of the Picard iteration

$$(Px)(t) = \int_0^t (1 + x(\tau)^2) d\tau.$$

and compare with the explicit solution.

2. Rudin Chapter 7, Problems 8, 9 (forget the converse), 10 (forget for now the Riemann integral).