1 (25 pts). Problem 7 in §1.1 of Strauss.

2 (25 pts). Compute the derivatives of the following functions:

- \( F(t) = \arctan \frac{x(t)^2 + y(t)^2}{\sin x(t)} \);
- \( F(t) = \int_{-1/2}^{t/2} f(xt^{-1}, x) \, dx. \)

In doing so, indicate clearly the various functions being composed and the chain rule.

3 (25 pts). Find all solutions to the following ODE (Hint: use partial fractions):

\[ xy' + y(1 - y) = 0. \]

4 (25 pts). Problem 7 in §1.2 of Strauss.