

PARTIAL DIFFERENTIAL EQUATIONS

HOMEWORK # 1 (due Th Sep 5)

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

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

- $F(t) = \arctan \frac{x(t)^2 + y(t)^2}{\sin x(t)}$;

- $F(t) = \int_{-2t^2}^{t^{1/2}} f(xt^{-1}, x) dx$.

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.