

Assignment #1. Due January 28th.

1 point per a problem.

Writing must be clear and organized. The letters should be sufficiently large for the instructor to read.

- In problems #1 - #5, classify the differential equations according to their order, ordinary (ODE) vs partial (PDE), linear vs non-linear, equation vs a system. Name the independent and dependent variables in each case:

1. $\frac{dx}{dt} - t^2x = \sin t$

2. $\frac{d^3v}{dt^3} - t^2v = \sin v$

3. $t\ddot{u} + 2\dot{u} - t = 0$

4. $u''_{xx} + uu'_y = x^2$

5. $\begin{cases} \frac{dx}{dt} = x - y + t^2 \\ \frac{dy}{dt} = x + y \end{cases}$

- Write an example of a first order non-linear PDE
- Write an example of a second order linear ODE.
- Section 1.1. Solve the problems ## 3, 7, 11, 15-20 (give reasons), 22.
- Section 1.2 Problem # 9.
- Section 1.3 Problems ## 7, 9, 11.