

Assignment #1. Due January 25th. 1 point per a problem.

In problems for sections 1.1 and 1.2, show work.

- Solve the problems ## 2, 4, 8, 17, 25 from the Section 1.1
- Read Section 1.2 and solve the problems ## 6, 11, 16
- Section 1.4:
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. $\frac{dv}{dt} - t^2v = \sin v$

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

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

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

6. Write an example of a first order non-linear PDE

7. Write an example of a second order linear ODE.