Assignment #1. Due January 26th. 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.