The goals of this discussion section are:

1. Get familiar with non-dimensionalizing

2. Acquire some sense of scales to use in a model

3. Create simple models (students should be creative !)

Participation in discussion section counts as 5% of the grade. Completion of the worksheets counts as 20% of the grade. **Submit your worksheet work by February 3rd at 2:59pm.**

1. Consider the product $\pi = R^{\alpha} E^{\beta} t^{\gamma} \rho^{\delta}$, where R is the radius of a bomb, E the energy of the bomb, t denotes the time, and ρ the density of the bomb.

   - Find $\alpha.\beta, \gamma, \delta$ so that π has no dimension.
   - Discuss how this quantity can help you deduce information about a system related to bombs detonation.

2. Consider the system of differential equations below, with $\beta > 0$

$$\frac{dx}{dt} = \alpha\, x(M - \beta x - \gamma y)$$
$$\frac{dy}{dt} = \alpha\, (y^2 + 1)(M - \epsilon x)$$

   Use changes of variables, for x, y, and t and rename parameters to simplify the system so that only two parameters are required to describe its behavior.

3. Work on the exercises 2.1, 2.2, from the typed notes `Math150_Chapter2.pdf`

4. Submit your work on Catcourses under the assignment `Worksheet 2` **as a .pdf**.