# Topics in Mathematical Physics (PHYS 320):2 <span style="float:right">Spring 2019</span>

Read: Boas Chapter 8 Sections 2-4

(1) Refine our model of water draining from a 'right' funnel, such as we have in the classroom, to include terms coming from $R(h) = h + r$. Obtain the solution of the resulting differential equation. Find the time to drain based on measurements you make and check your result. Discuss the agreement or lack thereof.

(2) Consider the differential equation

$$x\frac{du}{dx} + u^2 = 4.$$

Describe this equation. Obtain the general solution $u(x)$. Where is your solution valid?