

## CALCULUS II, SUMMER 2015 - ODE WORKSHEET 2

**Problem 1.** Solve  $y' = \frac{x^2}{y^2}$  with the initial condition  $y(0) = 2$ .

**Problem 2.** Solve  $y' = \frac{6x^2}{2y + \cos y}$ .

**Problem 3.** Solve  $y' = x^2y$ .

**Problem 4.** Solve  $y' = \frac{x^2 + 2y^2}{xy}$

**Problem 5.** Solve  $(2y^2 - x^2)y' + 3xy = 0$

**Problem 6.** Solve  $y^2 + (x^2 - xy + y^2)y' = 0$ .

**Problem 7.** The half-life of Thorium-234 is approximately 24 days. If there is 100kg of Thorium-234, how much of it will remain in a year?

**Problem 8.** What is the displacement, at time  $t = 10$ , of the free-falling object of mass 100 with air resistance constant 1 and initial velocity 10 at time  $t = 0$ ?

**Suggested reading:** Stewart, pp.412-415; Apostol, §§8.5, §§8.6, §§8.24, §§8.25, §§8.26 (ignore the direction field stuff)