

**Problem 1:** (5 points) Find the solution to

$$\frac{dy}{dt} - \frac{2}{t}y = 4t^5$$

satisfying  $y(1) = 2$ .

**Problem 2:** (5 points) Find the order four series approximation (i.e., find  $a_0$  through  $a_4$ ) to the differential equation

$$\frac{dy}{dt} = y + 6 \cos t$$

satisfying  $y(0) = 0$ . *Hint:* Recall that  $\cos t = 1 - \frac{t^2}{2!} + \frac{t^4}{4!} \pm \dots$