

HOMWORK 4-PART A

1. Determine the interval of existence of following equation.

$$\frac{dy}{dt} = \frac{t-2}{y+1}, \quad y(-1) = 1.$$

In exercises 2-3,

- (i) Find the general solution of the differential equation. sketch several members of the family of solutions portrayed by the general solution.
- (ii) Show that there is no solution satisfying the given initial condition. Explain why this lack of solution does not contradict the existence theorem.

2. $ty' - y = t^2 \cos t, \quad y(0) = -3.$

3. $ty' = 2y - t, \quad y(0) = 2$