Problem set 4
Mathematical Methods

Problem 1

Determine $y(t)$ such that

$$\int_0^2 12ty + y'^2 dt$$

Is minimized and $y(0) = 0$, $y(2) = 8$.

Problem 2

Determine $y(t)$ such that

$$\int_0^1 y^2 + y'y + y'^2 dt$$

Is minimized and $y(0) = 0$, $y(1) = 1$.

Problem 3

Suppose the following capital accumulation:

$$\dot{k} = f(k) - \delta k - c$$

Given the initial capital stock k(0), depict the phase diagram for the optimal growth of capital and consumption to maximize:

$$\int_0^\infty U(c)e^{-\rho t} dt.$$