

## Problem Set 7 (due Thursday Nov. 19)

You may discuss the problems with your classmates but you must write your own solutions. Be clear and to the point. Page numbers refer to the text “Variational methods in Optimization” by Donald R. Smith .

1. Verify that each of the integrands is strongly convex and find the unique minimizer

a.  $I(y) = \int_0^1 (y'^2 + 2e^x y) dx$ ,  $y(0) = 0$ ,  $y(1) = 1$ .

b  $I(y) = \int_0^{\pi/6} ((y' - \cos x)^2 + 4y(x)) dx$ ,  $y(0) = 0$ ,  $y(\pi/6) = 1/2$ .

2. p.166: 2,6,8,