# MATH 3630 - Actuarial Mathematics I
## Fall 2011 - Valdez
## Homework No. 1
## due Wednesday, 5:00 PM, 21 September 2011

**Please return this page with your signature. Please write your name and student number at the spaces provided:**

**Name:** _____ **Student ID:** _____

I certify that this is my own work, and that I have not copied the work of another student.

**Signature:** _____ **Date:** _____

For a certain population, the force of mortality is expressed as [1]

$$\mu_x = \log(2) + \frac{1}{2(80-x)}, \quad \text{for } 0 \leq x < 80.$$

1. Derive the corresponding survival function $S_0(x)$ and demonstrate that it satisfies the important properties of a legitimate survival function.
2. Give an expression for ${}_tp_x$ and interpret this expression.
3. Calculate the probability that a life aged 45 will die between ages 60 and 70.

[1] Note that log in the expression is the natural logarithm.