

MATH 3630 - Actuarial Mathematics I
Fall 2008 - Valdez
Homework No. 1
due Monday, 6:50 PM, September 8, 2008

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:** _____

Let X be the lifetime (of a newborn) random variable with SDF defined by

$$S_X(x) = e^{-(x/\lambda)^k} \text{ for } x \geq 0,$$

where λ and k are both parameters.

1. Give constraints on the values of the parameters λ and k so that the function above is a legitimate SDF. Justify your solution.
2. Find the hazard rate at age x , μ_x .
3. Find an expression for $\overset{\circ}{e}_0$, the average future lifetime of a newborn.
4. Suppose $\lambda = \frac{15}{2}$ and $k = \frac{3}{4}$. Calculate ${}_{20|10}q_{20}$ and interpret this probability.