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Errata for the *Solutions Manual for Bowers' et al Actuarial Mathematics, 2007 Edition*

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Solutions to 6.4b and 6.4c should be:

b. Let $\bar{P}$ be the premium rate sought. We have $L = e^{-\delta T} - \bar{P}\bar{a}_{\overline{T}|}$ and this is a decreasing function of T. The 50-th percentile of L is found at the value corresponding to the 50-th percentile of T, which is ln2 times the mean, or $\frac{\ln 2}{\mu} = \frac{\ln 2}{0.02} \approx 34.66$ years. Based on this

$$0 = e^{-0.06\cdot\frac{\ln 2}{0.02}} - \bar{P}\cdot\frac{1-e^{-0.06\cdot\frac{\ln 2}{0.02}}}{0.06}$$

so that

$$\bar{P} = \frac{e^{-0.06\cdot\frac{\ln 2}{0.02}}}{\frac{1-e^{-0.06\cdot\frac{\ln 2}{0.02}}}{0.06}} = \frac{2^{-3}}{\frac{1-2^{-3}}{0.06}} = \frac{\frac{1}{8}}{\frac{7}{8}\cdot\frac{100}{6}} = \frac{6}{7\cdot 100} \approx 0.008571.$$

c. Let $\bar{P}$ be the premium rate sought. With zero force of interest $e^{-\delta T} = 1$ and the prospective loss function at policy duration 0 becomes

$$L = 1 - \int_0^T \bar{P}\,dt = 1 - \bar{P}T.$$

Then

$$0.50 = \Pr\left(L > 0\right) = \Pr\left(1 - \bar{P}T > 0\right) = \Pr\left(\frac{1}{\bar{P}} > T\right) = \Pr\left(T < \frac{1}{\bar{P}}\right).$$

This implies that $\frac{1}{\bar{P}}$ is the median of T, i.e., $\frac{1}{\bar{P}} = \frac{\ln 2}{\mu}$, or $\bar{P} = \frac{\mu}{\ln 2} = \frac{0.02}{\ln 2} \approx 0.028854.$

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In the solution of Exercise 3.4b the last formula should be:

$$s'\left(1\right) = -\frac{11}{6} + \frac{11}{4} - \frac{7}{8} = -\frac{11}{6} + \frac{15}{8} = -\frac{44}{24} + \frac{45}{24} = \frac{1}{24} > 0.$$

instead of

$$s'\left(\frac{1}{2}\right) = -\frac{11}{6} + \frac{11}{8} - \frac{7}{32} = -\frac{11}{6} + \frac{37}{32} = -\frac{176}{96} + \frac{111}{96} = -\frac{65}{96.}$$