Exercise 8.2

(a) The Actuarial Present Value of the benefit can be expressed as

$$100000 \times \int_0^5 e^{-\delta t} \, {}_t p_{60}^{00} \left(\mu_{60+t}^{01} + \mu_{60+t}^{02} \right) dt.$$

(b) Since ${}_t p_{60}^{00} = {}_t p_{60}^{\overline{00}} = e^{-.025t}$, then this Actuarial Present Value equals

$$100000 \times \int_0^5 e^{-.05t} e^{-.025t} (0.025) dt = 100000 \times \frac{.025}{.075} \left(1 - e^{-.075*5} \right) = 10,423.69$$