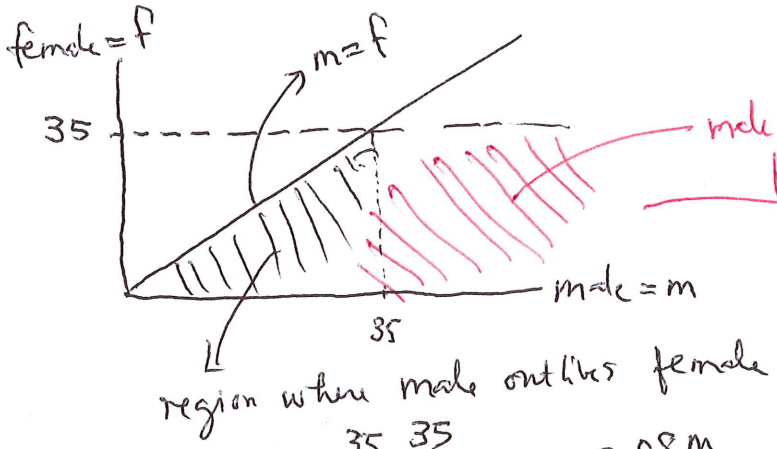
MATH 3631 - Actuarial Mathematics II
Spring 2018 - Valdez
Quiz No. 8
Wednesday, 25 April 2018

Name: EMIL **Student ID:** Suggested Solution

You are given:

- Female mortality follows DeMoivre's law with $\omega = 100$. $\Rightarrow {}_{t}T_{65}^{f} \sim$ deMoivre $(\omega = 35)$
- Male mortality assumes a constant force with $\mu = 0.08$. $\Rightarrow {}_{t}T_{65}^{m} \sim$ exponential $(\mu = .08)$ by memoryless
- The future lifetimes of females and males are independent.

Calculate the probability that a male age 65 outlives a female of the same age.



The probability is $\int_0^{35}\int_f^{35} \frac{1}{35}\cdot.08e^{-.08m}\,dm\,df + \int_{35}^{\infty}.08e^{-.08m}\,dm$

$= \frac{1}{35}\int_0^{35}\left(e^{-.08f} - e^{-.08(35)}\right)df + e^{-.08(35)}$

$= \frac{1}{35}\cdot\frac{1}{.08}\left(1-e^{-.08(35)}\right) - \frac{1}{35}\cdot e^{-.08(35)}(35) + e^{-.08(35)}$

$\approx$ ~~0.2746149~~ 0.335425