Exercise 3.7

For $t = 5, 6, \ldots$, we are given $\mu^A_{x+t} = 1.5\mu_{x+t}$ so that

$$p^A_{x+t} = (p_{x+t})^{1.5}.$$

It follows therefore that the probability that an employee posted in country A at age 30 will survive to reach age 40 if she remains in that country is given by

$$\begin{aligned}
{}_{10}p^A_{[30]} &= {}_5p^A_{[30]} \cdot {}_5p^A_{[30]+5} \\
&= p^A_{[30]} \cdot p^A_{[30]+1} \cdot p^A_{[30]+2} \cdot p^A_{[30]+3} \cdot p^A_{[30]+4} \cdot \underbrace{p^A_{35} \cdot p^A_{36} \cdot p^A_{37} \cdot p^A_{38} \cdot p^A_{39}}_{({}_5p_{35})^{1.5}} \\
&= \left[1 - 6\left(1 - \frac{98362}{98424}\right)\right]\left[1 - 5\left(1 - \frac{98296}{98362}\right)\right]\left[1 - 4\left(1 - \frac{98225}{98296}\right)\right] \\
&\qquad \times \left[1 - 3\left(1 - \frac{98148}{98225}\right)\right]\left[1 - 2\left(1 - \frac{98064}{98148}\right)\right]\left(\frac{97500}{98064}\right)^{1.5} \\
&= 0.9774967.
\end{aligned}$$