

Exo 1

you are given

$$S(t) = \begin{cases} 1 - t/100 & , 0 \leq t < 30 \\ 0.7 e^{-0.02(t-30)} & , t \geq 30 \end{cases}$$

calculate $E(T_0)$.

Exo 2

You are given

(i) $N_x = \frac{1}{w-x}$; $0 \leq x < w$

(ii) $\text{Var}(T_x) = 468.75$

Find w .

Exo 3

For a group of lives aged 30, containing an equal number of smokers and non-smokers, you are given:

(1) For non smokers, $\mu_x^{\text{ns}} = 0.08$, $x \geq 30$

(2) For smokers, $\mu_x^{\text{s}} = 0.16$, $x \geq 30$

Calculate q_{80} for a life randomly selected from those surviving to age 80.

Exo 4

You are given the following 4-year select and ultimate life table:

$[x]$	$q[x]$	$q[x]+1$	$q[x]+2$	$q[x]+3$	q_{x+4}	$x+4$
40	0.00101	0.00175	0.00205	0.00233	0.00257	44
41	0.00113	0.00188	0.00220	0.00252	0.00293	45
42	0.00127	0.00204	0.00240	0.00280	0.00337	46
43	0.00142	0.00202	0.00262	0.00316	0.00384	47
44	0.0157	0.00240	0.00301	0.00367	0.00445	48

1) Calculate the index of selection at age 44, $I(44, k)$ for $k = 0, 1, 2, 3$ (2)

2) Construct the table of

$$l_{[x]+t}, \text{ for } x = 40, 41, 42$$

and for all t , Use $l_{[40]} = 10\,000$

3) Calculate the following:

a) ${}_2P[42]$

b) ${}_3q[41] + 1$

c) ${}_3|_2q[41]$