

# Tables de génération: Solutions des exercices Lösungen der Aufgaben

Journée de formation continue de la  
Chambre suisse des actuaires-conseils  
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## Solution / Lösung ( $i = 3,5\%$ )

Âge	100% q	90% q	Augmen- tation	50% q	Augmen- tation
65	13.829	14.218	2.8%	16.328	18.1%
70	11.743	12.143	3.4%	14.366	22.3%
75	9.545	9.946	4.2%	12.234	28.2%
80	7.441	7.822	5.1%	10.076	35.4%
85	5.562	5.906	6.2%	8.017	44.1%
90	4.051	4.343	7.2%	6.214	53.4%

## Solution / Lösung (i = 0%)

Âge	100% q	90% q	Augmen- tation	50% q	Augmen- tation
65	19.495	20.275	4.0%	24.882	27.6%
70	15.599	16.312	4.6%	20.601	32.1%
75	11.978	12.615	5.3%	16.536	38.1%
80	8.859	9.408	6.2%	12.877	45.4%
85	6.322	6.774	7.1%	9.731	53.9%
90	4.429	4.786	8.1%	7.207	62.7%

## Solution / Lösung

$$G(t) = t \cdot \frac{1}{\omega - x}$$

$$g(t) = \frac{1}{\omega - x}$$

$$\mu_{x+t} = \frac{g(t)}{1 - G(t)} = \frac{\frac{1}{\omega - x}}{1 - t \cdot \frac{1}{\omega - x}} = \frac{1}{\omega - x - t}$$

*De Moivre*



## Solution / Lösung

$$\mu_x^D = (1 + \lambda)\mu_x^S = (1 + \lambda)B \cdot c^x, \text{ Gompertz}$$

avec

$$c^Z = (1 + \lambda)$$

$$\mu_x^D = c^Z B \cdot c^x = Bc^{(x+Z)} = \mu_{x+Z}^S$$



## Solution / Lösung

D'abord :

$${}_k P_{65,2010} = \prod_{j=0}^{k-1} [1 - q_{65+j,2010+j}]$$

Ensuite :

$$e_{65,2010}^0 = \sum_{k=1}^{\omega-65-1} {}_k P_{65,2010} + \frac{1}{2}$$

## Solution / Lösung

$$q_{x,t} = a_x + b_x \cdot c_x^t$$

"Nolfi":  $q_{x,t} = q_{x,t_0} e^{-\lambda_x(t-t_0)}$

$$a_x = 0$$

$$b_x = q_{x,t_0} e^{\lambda_x t_0}$$

$$c_x^t = e^{-\lambda_x t}$$

## Solution / Lösung

$$\ln \mu_{x,t} = \alpha_x + \beta_x \kappa_t + \varepsilon_{x,t}$$

$$\sum_t \ln \mu_{x,t} = \sum_t \alpha_x + \beta_x \sum_t \kappa_t + \sum_t \varepsilon_{x,t}$$

$$\sum_t \ln \mu_{x,t} = N \cdot \alpha_x \quad N = \text{nombre } t$$

$$\alpha_x = \frac{1}{N} \sum_t \ln \mu_{x,t}$$