

$$\frac{dN(t)}{dt} = \alpha t (9 - N(t))$$

$$\int \frac{dN(t)}{9 - N(t)} = \int \alpha t dt \rightarrow -\ln|9 - N(t)| = \frac{\alpha t^2}{2} + C$$

$$N(t) = -e^{-\frac{\alpha t^2}{2}} e^C + 9$$

$$t=0 \quad N(t)=0$$

$$e^C = 9$$

$$\boxed{N(t) = 9(1 - e^{-\frac{\alpha t^2}{2}})}$$

$$t=1$$

$$t=2$$

$$t=3$$

$$t=4$$

0. 2.9531191 7.5340304 9.5714787 9.9630214

2)

$$\frac{N(t_{i+1}) - N(t_i)}{\Delta t} = \alpha t (9 - N(t))$$

$\Delta t \rightarrow 1$

$$N(t_{i+1}) = \alpha t (9 - N(t_i)) \Delta t + N(t_i)$$

$$N(0) = 0$$

$$1$$

$$2$$

$$3$$

$$4$$

$$0.$$

$$7.$$

$$11.2$$

$$8.68$$

3)

3 Ciprar

$$t=1$$

$$G_t$$
  

$$0,23\%$$

$$t=2$$

$$0,079\%$$

4 Ciprar

$$t=1$$

$$0,02\%$$

$$t=2$$

$$0,012\%$$

4)

$$F(x_{i+1}) = F(x_i) + \frac{F'(x_i)}{1!} h + R_n$$

$$N(t) = q \left( 1 - e^{-\frac{\alpha t^2}{2}} \right)$$

$$N(t) = q e^{-\frac{\alpha t^2}{2}} \times \alpha t$$

$i$	$x_i$	$F(x_i)$	$E_T$	$E_q$
0	0	0.	0.	---
1	1	0.	2.95	---
2	2	7.88	0.5	100%

5)

$$N(t) = q \left( 1 - e^{-\frac{\alpha t^2}{2}} \right)$$

$$\alpha = 0,7$$

$$t = 2$$

$$N(t) = 22$$

$$F(q) = q \left( 1 - e^{-\frac{\alpha t^2}{2}} \right) - N(t)$$

$$F(q) = q \left( 1 - e^{-1,4} \right) - 22$$

$$F(q) = q(0,753403036) - 22$$

$$q = \frac{22}{0,753403036} = 29,2$$

Bisection  $[0, 40]$

$X_l$	$X_u$	$X_r$	$F(X_r)$	$E_r$	$E_A$
0.	0.	40.	20.	-6.9319393	31.08% 100%
1.	20.	40.	30.	0.6020911	3.37% 33.33%
2.	20.	30.	25.	-3.1649241	13.8% 20%
3.	25.	30.	27.5	-1.2814165	5.23% 9.09%

5b)

$$X_{i+1} = X_i - \frac{F(X_i)}{F'(X_i)}$$

$$\hat{X}_r = 29,2$$

$$F(40) = 8,136$$

$$F'(q) = 0,753403036$$

$$X_0 = 40$$

$$X_1 = 40 - \frac{8,13}{0,7534} = 29,14$$

$X_r$	$F(X_r)$	$E_r$	$E_q$
40	8,13	36,98%	---
29,14	$4,5 \times 10^{-2}$	0,2%	37%
29,08	$9,1 \times 10^{-2}$	0,4%	0,2%

$$X_2 = 29,14 - \frac{4,5 \times 10^{-2}}{0,7534}$$