$$S(x) = \begin{cases} e^{-\frac{a(t-t_0)^2}{2}} + \int_{t_0}^{t} a(x-t_0)e^{-\frac{a(x-t_0)^2}{2}} \cdot e^{-\lambda(t-x)}\,\mathrm{d}x & \text{if } t > t_0 \\ 1 & \text{if } t \leq t_0 \end{cases} \tag{1}$$

$$S(x) = \prod_{i=1}^{x}(1-B_i) + \sum_{i=1}^{x} B_i \cdot e^{(i-x-1)\cdot r} \cdot \prod_{j=1}^{i-1}(1-B_j) \tag{2}$$

$$B_x = \begin{cases} 0 & \text{if } x < t_0 = -\frac{b}{a} \\ 1 - e^{-ax+at_0+a/2} & \text{if } x \geq t_0 \end{cases}$$

$$S(x) = \prod_{i>t_0}^{x} e^{-ai+at_0+a/2} + \sum_{i>t_0}^{x}(1-e^{-ai+at_0+a/2}) \cdot e^{(i-x-1)r} \cdot \prod_{j>t_0}^{i-1} e^{-aj+at_0+a/2} \tag{3}$$