

$$\mu_x = \frac{1}{x+1}, x \geq 0$$

$F_x, S_x, f(x)$

$$S_x = e^{-\int_0^x \mu_z dz} = e^{-\int_0^x \frac{1}{z+1} dz} = e^{-\ln(z+1) \Big|_0^x} = e^{-\ln(x+1)}$$

$$\textcircled{*} \quad \textcircled{1} = (x+1)^{-1} = \frac{1}{x+1}$$

$$F_x = 1 - \frac{1}{x+1}$$

$$f(x) = \frac{1}{(x+1)^2}$$

Is S_x valid?

$$S_0 = \frac{1}{0+1} = 1 \quad S_{\infty} = \frac{1}{\infty+1} = \frac{1}{\infty} \rightarrow 0$$

$$\frac{d}{dx} \left(\frac{1}{x+1} \right) = -\frac{1}{(x+1)^2} < 0 \quad \forall x \in \mathbb{R}$$

ln

$F_x, S_x, f(x)$

$$\mu_x = \frac{1}{x+1}$$

$${}^{10}P_{40} = \frac{S_{50}}{S_{40}} = \frac{\frac{1}{51}}{\frac{1}{41}} = \frac{41}{51} = \frac{1}{1.24}$$

(.8039)

$${}^{20}P_{50} = \frac{\frac{1}{51}}{\frac{1}{51}} = \frac{51}{51} = .7183$$

$${}^{10}L_{20} q_{40} = {}^{60}q_{40} - {}^{10}q_{40} \approx 30q_{40} \cdot {}^{10}P_{40}$$

${}^{10}L_{20} q_{40}$ is the probability a 40 year old lives for 10 years and then dies within the following 20 years.

$$= 30q_{40} - 10q_{40} \text{ or } {}^{10}P_{40} - 30P_{40} = \frac{41}{51} - \frac{41}{71} = .2265$$

$$l_{20} = 1000000$$

$$l_{80} = l_{20} \cdot \rho_{20}$$

$$\left[\frac{21}{81} \right] \times 1000000$$

$$= 259259.259$$

$$\frac{1}{Hx} = (H) = 10$$

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$$0.5 \cdot \frac{1}{1+x} = 2 \quad 1 - \frac{1}{1+x} = 2$$

$$\pi E \times V \cdot 0.5 \cdot \frac{1}{(1+x)} = (1) \cdot 2$$

$$\frac{1}{1+x} = 0.5 \quad 1-x = 0.5 \quad x = 0.5$$

$$1815 - \frac{12}{15} \cdot 1815 = 1815$$

after 50% off = before
before

cost of 20 mil of 0.5 off = 10 mil

new 20 mil off 0.5 off = 10 mil

$$20 \cdot 0.5 - \frac{10}{15} - \frac{10}{15} = 10 \text{ mil} - 10 \text{ mil} = 0$$