Limited Fluctuation Credibility Homework Solutions

1. $\lambda_0 = \left(\frac{y}{r}\right)^2$

   $F(2.326) = \left(\frac{1+P}{2}\right) = .99$, so y = 2.326

   $\lambda_0 = \left(\frac{2.326}{.10}\right)^2 = 541.03$

2. $\lambda_0 = \left(\frac{y}{r}\right)^2$

   $F(1.96) = \left(\frac{1+P}{2}\right) = .95$, so y = 1.96

   $\lambda_0 = \left(\frac{1.96}{0.01}\right)^2 = 38,416$

3. $\lambda_0 = \left(\frac{y}{r}\right)^2$ therefore $y = r\sqrt{\lambda_0}$ where λ_0 (the full credibility standard)

   $y = 0.04\sqrt{961} = 1.24$

   $F\left(1.24\right) = 0.8925 = \left(\frac{1+P}{2}\right)$, therefore P=0.785

4. standard for full credibility for non-poisson = $\lambda_0\left(\frac{\sigma_N^2}{\mu_N}\right)$

   standard for full credibility for poisson = λ_0

   ratio of revised to original = $\left(\frac{\sigma_N^2}{\mu_N}\right) = \left(\frac{\gamma\beta(1+\beta)}{\gamma\beta}\right) = \left(1+\beta\right) = 1.5$

5. standard for full credibility = $\lambda_0\left(\frac{\sigma_X}{\mu_X}\right)^2 = \left(\frac{1.96}{0.05}\right)^2\left(\frac{1,000,000}{500^2}\right) = 6,146.56$

6. standard for full credibility = 2,000 = $\lambda_0\left[1+\left(\frac{\sigma_X}{\mu_X}\right)^2\right] = \left(\frac{2.576}{0.10}\right)^2\left(1+\left(\frac{\sigma_X}{\mu_X}\right)^2\right)$

   $\left(\frac{\sigma_X}{\mu_X}\right) = 1.41914$