Chapter 9 Question 2

- given:

9.4 $\lambda(t) = e^{\beta_0 + \beta_1 x(t) + \beta_2 x(t)^2}$

9.5 $\lambda(t) = \alpha e^{\frac{-(x(t)-\mu)^2}{2\sigma^2}}$

$\alpha = e^{\beta_0 - \frac{\beta_1^2}{4\beta_2}} \quad \mu = \frac{-\beta_1}{2\beta_2} \quad \sigma^2 = -\frac{1}{2\beta_2}$

- proof

9.5 $\lambda(t) = \alpha e^{\frac{-(x(t)-\mu)^2}{\sigma^2}}$

$= e^{\beta_0 - \frac{\beta_1^2}{4\beta_2}} e^{\frac{-(x(t) + \frac{\beta_1}{2\beta_2})^2}{2(-\frac{1}{2\beta_2})}}$

$= e^{\beta_0 - \frac{\beta_1^2}{4\beta_2} + \frac{-(x(t) + \frac{\beta_1}{2\beta_2})^2}{2(-\frac{1}{2\beta_2})}}$

$= e^{\beta_0 - \frac{\beta_1^2}{4\beta_2} + \beta_2 (x(t) + \frac{\beta_1}{2\beta_2})^2}$

$= e^{\beta_0 - \frac{\beta_1^2}{4\beta_2} + \beta_2 [x(t)^2 + 2(\frac{\beta_1}{2\beta_2} x(t)) + \frac{\beta_1^2}{4\beta_2^2}]}$

$= e^{\beta_0 - \frac{\beta_1^2}{4\beta_2} + \beta_2 x(t)^2 + \beta_1 x(t) + \frac{\beta_1^2}{4\beta_2}}$

$= e^{\beta_0 + \beta_1 x(t) + \beta_2 x(t)^2}$

$= \lambda(t)$ 9.4