

# Solution #53

Given

$$N_{x+t} = N_{x+t:y+t}^{02} + N_{x+t:y+t}^{03} = N_{x+t:y+t}^{13} = 9 \quad 0 \leq t \leq 5$$

$$N_{y+t} = N_{x+t:y+t}^{01} + N_{x+t:y+t}^{03} = N_{x+t:y+t}^{23} = h \quad 0 \leq t \leq 5$$

$$N_{x+t:y+t}^{03} = .01 \quad 0 \leq t \leq 5$$

$$P_{x+t} = .96 \quad 0 \leq t \leq 4$$

$$P_{y+t} = .97 \quad 0 \leq t \leq 4$$

$$P_{x+t} = e^{-\int_0^t N_{x+t} dt} \Rightarrow .96 = e^{-N_{x+t}} \Rightarrow N_{x+t} = .04082$$

$$P_{y+t} = e^{-\int_0^t N_{y+t} dt} \Rightarrow .97 = e^{-N_{y+t}} \Rightarrow N_{y+t} = .03046$$

$$N_{x+t} = .04082 = N_{x+t:y+t}^{02} + N_{x+t:y+t}^{03}$$

$$.04082 = N_{x+t:y+t}^{02} + .01$$

$$N_{x+t:y+t}^{02} = .03082$$

$$N_{y+t} = .03046 = N_{x+t:y+t}^{01} + N_{x+t:y+t}^{03}$$

$$.03046 = N_{x+t:y+t}^{01} + .01$$

$$N_{x+t:y+t}^{01} = .02046$$

$${}_5P_{xy} = e^{-\int_0^5 N_{x+t:y+t}^{00} dt}$$

$$= e^{-\int_0^5 N_{x+t:y+t}^{01} + N_{x+t:y+t}^{02} + N_{x+t:y+t}^{03} dt}$$

$$= e^{-5(.06128)}$$

$$= .73609$$

$$\approx .74$$

**E**

