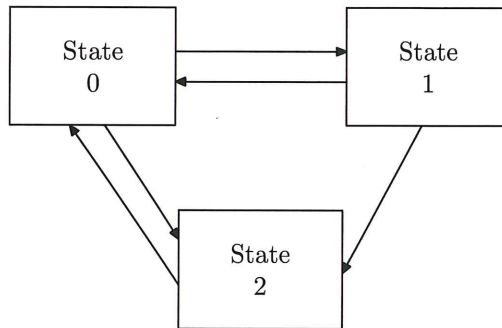


**MATH 3631 - Actuarial Mathematics II**  
**Spring 2020 - Valdez**  
**Quiz No. 3**  
**Wednesday, 4 March 2020**

Name: EMIL

Student ID: Suggested Solutions

You are given the following multiple state model:



Based on Kolmogorov's forward equations, the following differential equation is used to solve for the probability of transitioning from State 0 to State 2:

$$\frac{d}{dt} {}_t p_x^{02} = {}_t p_x^{00} \mu_{x+t}^{02} + \dots$$

Write out the rest of the formula. Hint: There are two missing terms: one with a plus (+) sign and one with a minus (-) sign.

$$\frac{d}{dt} {}_t p_x^{02} = {}_t p_x^{00} \mu_{x+t}^{02} + {}_t p_x^{01} \mu_{x+t}^{12} - {}_t p_x^{02} \mu_{x+t}^{20}$$