Consider the following semi-Markovian model

1. Test, using do-calculus, whether the causal effect $P(y|do(x), do(z))$ is identifiable. If the answer is yes, provide an expression for $P(y|do(x), do(z))$. If the answer is no, prove it directly.

2. List the causal effects that are identifiable in the model above. State your reasoning for each.

3. Can you think of a real-life problem having this structure?

4. Prove explicitly that $P(y|do(x))$ is not identified in the model of Figure 3.7(a).

5. Prove Eq. (3.49) using do-calculus.