That’s really cool!

I haven’t used Mathematica before, but the equations are clearly outlined in your screenshot.

Problem 2=binomial tree Vasicek

      -Look through class example.

Problem 4= trinomial tree Hull-White.

     -use equations from Matematica.

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**From:** Dragos Bozdog <[dbozdog@stevens.edu](mailto:dbozdog@stevens.edu)>  
**Sent:** Tuesday, October 25, 2022 12:27 PM  
**To:** Riley Heiman <[rheiman@stevens.edu](mailto:rheiman@stevens.edu)>  
**Subject:** Re: FE 680 Advanced Derivatives - Fall Semester Questions

Hello Riley,

Problem 2 in HW3 is related to the construction of the recombining binomial tree for Vasicek model, not the Hull-White trinomial tree. The formulas in your email are related to the calculation of the probabilities for branches in Hull-White model. For Vasicek, I provided an example in class with respect to the steps required to construct the binomial tree.

Please see below symbolic computations in Mathematica. The solutions match the solutions in the textbook for Hull-White model central branch probabilities.

Graphical user interface, application, Word

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Best Regards,

Dragos

**From:** Riley Heiman <[rheiman@stevens.edu](mailto:rheiman@stevens.edu)>  
**Sent:** Monday, October 24, 2022 2:16 PM  
**To:** Dragos Bozdog <[dbozdog@stevens.edu](mailto:dbozdog@stevens.edu)>  
**Subject:** RE: FE 680 Advanced Derivatives - Fall Semester Questions

Hi Professor,

I’m working on HW 3 problem 2, and could use your wisdom once again. :)

It’s ***unclear*** from the textbook how are being calculated.

Text

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 I rearranged the equations next to the **Blue star** to have an explicit formula for the probabilities. Do you believe these equations are correct? (.PDF of proof attached)

A picture containing text

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Are we approaching the problem the correct way? I’m skeptical, because problem 2 doesn’t provide a value for a.