Real Estate Finance - Homework 5
Due : November 19, in class

As usual, presentation will count for 5 points.

Problem 1 (22 pts), Graduated payment mortgages, with points

Consider a 5-year GPM with monthly payments, an annualized contract rate of 10%, and an initial balance of $100,000. The contract features two step-ups of equal size, after each of the first two years (in month 13 and month 25).

1. What is the loan's APR?
2. What must be the size of the step-ups for half of the principal to be paid after exactly 36 months?
3. Above what step size does the contract start featuring negative amortization?
4. Assume now that the lender charges two points to the borrower on this loan. Assuming a step size of 7% and a contract rate of 10%, what is the loan's APR?

Problem 2 (23 pts), Adjustable rate mortgages

Consider a 5-year ARM with monthly payments and initial balance $100,000. The market index can take only two values: 8% and 10%, annualized. The margin is 2%, and the rate adjusts every year, with no cap. The initial value of the index is 8%. At the first reset (new rate applies to month 13), there is a 40% probability that the index will change value from 8% to 10%. At the second reset (new rate applies to month 25) there is a 40% probability that the index will change again (to 8% from 10%, or vice-versa.) The index will then remain constant until maturity. The contract begins with a teaser contract rate of 6%, valid for one year, until the first adjustment.

1. What is the loan's APR computed according to government regulations?
2. Use simulations to compute the true APR of the loan.
3. What margin must the lender set to generate a truel APR of 10%?