Lecture 10

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TOI

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1 Todos

- HW5 we got 100% (you have the tex and pdf)
- HW6 due next tuesday 10am (7 is due next next double check if i need to)
- hw6 q1 is that amortization schedule that I made last time
- get these notes into Charlie Cruz's notation (or someone not me lol)
- tex lect 7 from kevin and the earlier lect from kat
- today's mantra: write math first then tex in dead moments
- Final is take home (due wednesday 4/26)
- schedule a tex all lecture notes day

2 3.3 The Sinking Fund Method of Loan Repayment

Recall the amortization method

$$K_t = I_t + PR_t$$

2.1 3.3.1 Remark:

Consider the following payment method:

1. Pay the interest at time t, I_t
2. Invest the principal, PR_t into a fund (sinking fund) at a arate j where $j > i$
3. Pay off L using a single payment at time $t = n$

Observe that ("break even"),

$$(K + L_i)S_{\overline{n}|j} = L$$

in practice,

$$(K + L_i)S_{\overline{n}|j} = L + extra$$

2.2 3.3.2 e.g.

Paul borrows 10,000 for 10 years at an annual effective rate i. He accumulates the amount needed to repay the loan by using a sinking fund. He makes 10 payments of X at the end of each year, each payment includes interest on the loan and the payment into the sinking fund which earns an annual effective rate of 8%. If the annual effective rate on loan had been $2i$, his total annual payment would have been $1.5X$. Calculate i.

Solution:
Observe that X=interest + principal
Principal going into the sinking is X-interest
consequently,

$$(X - 10000i)S_{\overline{10}|.08} = 10000$$
$$X - 10000i = 690.29$$