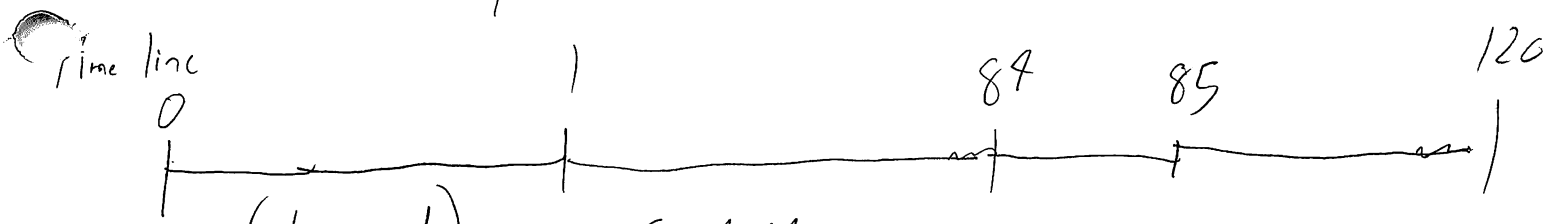
Problem Set 6.5

a) PV = 3,000,000
n = 120
r = 6.25%
PMT = −33,684.0291

PMT = −33,684.0291
n = 84
r = 6.25%
PV = 2,286,965.561

Refinance

PV = 2,286,965.561
n = 120
r = 4%
PMT = −23,154.4144



−20,000 (closing costs)
−90,000 (penalty)
−110,000

−23,154.4144
−(−33,684.0291)
+ 10,529.6147

= −23,154.4144

$CF_0 = -110,000$
$CF_1 = 10,529.6147$
$FO_1 = 84$
$CF_2 = -23,154.4194$
$FO_2 = 36$

$NPV @ \frac{6.25\%}{12} = \$114,764.3162$

Why 6.25%? Because it is the next best use of $110,000. If I don't use it to refinance, I can use it to pay down existing 6.25% loan. There are monthly payments, so the rate must be divided by 12.

b) i) Original loan remaining balance in 3 years

PMT = −33,684.0291

n = 48

r = 6.25

PV = $1,427,300.263

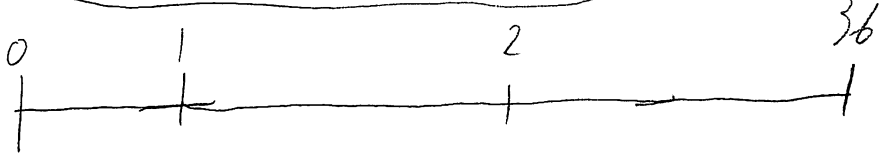
ii) Remaining balance on new loan in 3 years

PMT = −23,154.4144

n = .84

r = 4%

PV = $1,693,960.4144



−116,000 +10,529.6147 ... +16,529.6147

−1,693,960.237

+1,427,300.261

−256,130.3612

$CF_0 = -116{,}000$

$CF_1 = 10{,}529.6147$

$FO_1 = 35$

$CF_2 = -256{,}130.3612$

NPV @ 6.25% = 913,657.2156

Still refinance, but be careful, closer call.