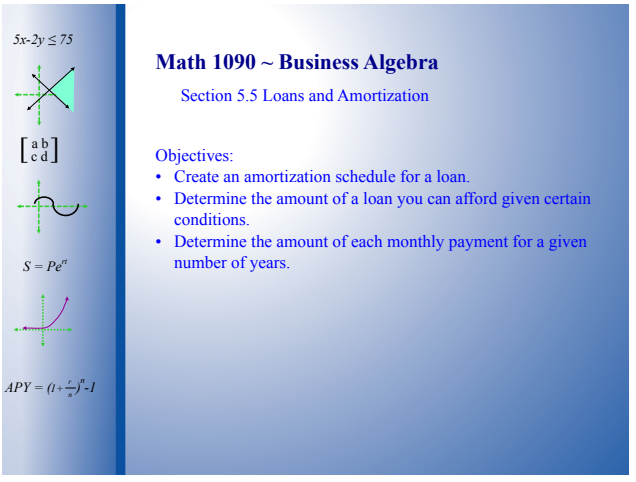

Amortization: An "installment loan" is a loan that is repaid by making all payments equal.

The bank is basically investing a lump sum of dollars and getting a periodic return which is exactly like PV of an ordinary annuity.

$$R = S\left(\frac{r_c}{1-(1+r_c)^{-N}}\right)$$ Amortization Formula

S = loan amount R = payment amount

Ex 1: When you graduate college, you buy a new car and can afford a monthly payment of $250/month. If you get a special rate of 3.6% interest, compounded monthly, for 6 years, how much can you afford to borrow?

Ex 2: Alex buys a house for $200,000. They put $15,000 down and get a loan for the rest at 5.4% interest compounded monthly for 20 years. What will their payments be?

Amortization Schedule

A loan of $10,000 with interest rate of 10% could be repaid in 5 equal annual payments.

$$R = S\left(\frac{r_c}{1-(1+r_c)^{-N}}\right)$$

	payment	interest	principal	unpaid balance
1	2637.97			
2	2637.97			
3	2637.97			
4	2637.97			
5	2637.97			

Ex 3: A company that buys a piece of equipment by borrowing $250,000 for 10 years at 6% compounded monthly has monthly payments of $2,775.51.

a) Find the unpaid balance after 1 year.

b) During that first year, how much interest does the company pay?

Loan Payoff Amount

$$S_{N-k} = R\left[\frac{1-(1+r_c)^{-(N-k)}}{r_c}\right]$$

k = number of payments that have been made.

$N = nt$ = total number of payments that were originally due.

N-k = number of payments "missing" from the loan.