4C – Loan Payments, Credit Cards, and Mortgages

For any loan, the _____ is the amount of money owed at any particular time. _____ is charged on the _____. In general, every payment should include _____ plus some amount that goes toward _____.

A loan that you pay off with _____ is called an _____ loan (or *amortized loan*).

The portions of installment loan payments going toward _____ and toward _____ vary as the loan is paid down. As the term proceeds, the portion going toward interest _____ and the portion going toward principal _____.

Loan Payment Formula (Installment Loans)
PMT = regular payment amount
P = starting loan principal (amount borrowed)
APR = annual percentage rate (as a decimal)
n = number of payment periods per year
Y = loan term in years (may be a fraction - _____)

$$PMT = \frac{P \cdot \left(\frac{APR}{n}\right)}{\left[1 - \left(1 + \frac{APR}{n}\right)^{(-nY)}\right]}$$

Examples:
1) (Ex 1, pg 253) Suppose you have student loans totaling $7500 when you graduate from college. The interest rate is APR=9% and the loan term is 10 years. What are your monthly payments? How much will you pay over the lifetime of the loan? What is the total interest you will pay on the loan?

2) Suppose you have a home mortgage of $120,000 with a fixed APR of 6.5% for 20 years. What are your monthly payments? How much will you pay over the lifetime of the loan? What is the total interest you will pay on the loan?

3) Suppose you apply for a 5 year loan in the amount of $22,000. Your monthly payment is $395 per month. Determine the total amount of interest paid over the 5 years.

4) Suppose you have a credit card balance of $3500 with an annual interest rate of 17%. You decide to pay off your balance over 1 year. How much will you need to pay each month? (Assume you make no further credit card purchases.)

5) Suppose you have a credit card balance of $3500 with an annual interest rate of 17%. You decide to pay off your balance over 18 months. How much will you need to pay each month? (Assume you make no further credit card purchases.)

Interest vs. Principal

TABLE 4.7 Interest and Principal Portions of Payments on a $7500 Loan (10-year term, APR = 9%)

END OF . . .	INTEREST = 0.0075 × BALANCE	PAYMENT TOWARD PRINCIPAL	NEW PRINCIPAL
Month 1	0.0075 × $7500 = $56.25	$95.01 − $56.25 = $38.76	$7500 − $38.76 = $7461.24
Month 2	0.0075 × $7461.24 = $55.96	$95.01 − $55.96 = $39.05	$7461.24 − $39.05 = $7422.19
Month 3	0.0075 × $7422.19 = $55.67	$95.01 − $55.67 = $39.34	$7422.19 − $39.34 = $7382.85

6) (#26, pg 265) Calculate the monthly payment and the portions of the payments that go to principal and to interest during the first 3 months of a student loan of $12,000 at fixed APR of 8% for 15 years.

End of …	Interest (.08/12)*balance	Payment toward Ppl	New Principal
Month 1			
Month 2			
Month 3			

Mortgages

Down Payment

Closing costs

Direct fees

Points

Fixed rate mortgage

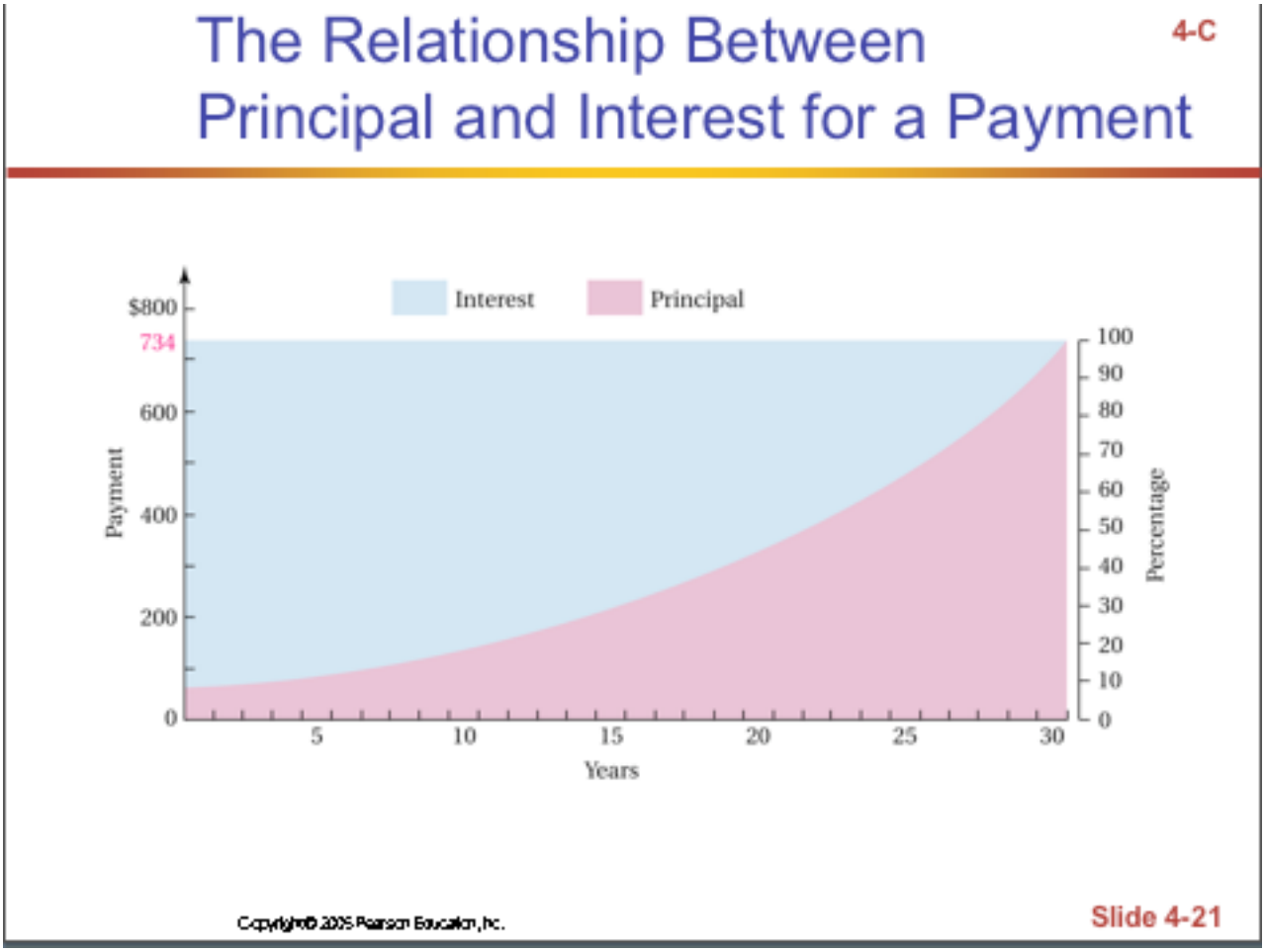
Adjustable-rate mortgage (ARM)

Refinance

5) You need a loan of $100,000 to buy a home. Compare the following loan choices by calculating your monthly payments and total closing costs in each case.

Choice 1: 30 year fixed rate at 7.5% with no closing costs and no points.

Choice 2: 30 year fixed rate at 6.5% with closing costs of $1200 and 4 points.



For a typical fixed rate mortgage, during which of the following years is the highest portion of each payment applied toward principal?

a) 1st year b) 10th year c) 20th year d) 30th year

For a typical fixed rate mortgage, during which of the following years is the highest portion of each payment applied toward interest?

a) 1st year b) 10th year c) 20th year d) 30th year

Be sure you can/know:

- How to use the formula presented in this lecture and work these types of problems.