

**MS-183/184  
Spreadsheets**

**Date Given: Friday, October 6, 2006**  
**Date Due: Friday, October 20, 2006**

The purpose of the spreadsheet assignment is to develop a spreadsheet to calculate payments made on an Amortized Loan repayment plan. The financial formulas needed to do this assignment will be covered in class and are listed below:

**Definitions**

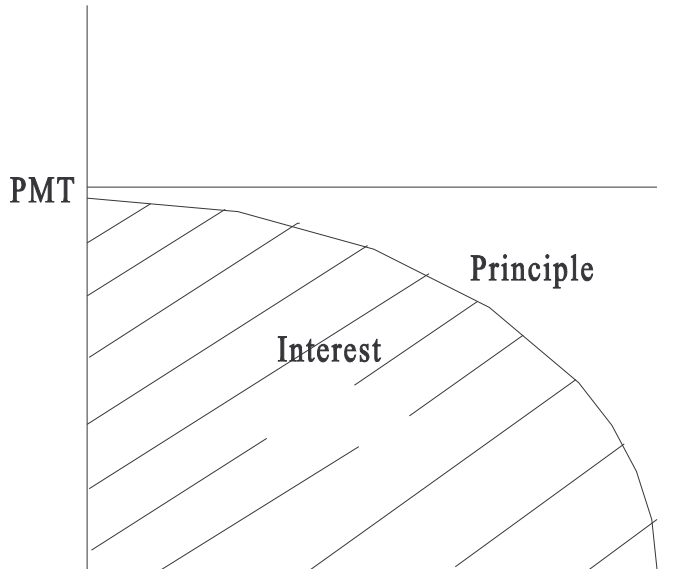
$n$	=	number of periods in the loan
$i$	=	periodic interest rate
$PV$	=	Present Value of the loan (i.e. the initial loan amount)
$FV$	=	Future Value of the loan (i.e. the value of the loan at maturity)
$PMT$	=	Periodic Payment amount
$bal_k$	=	Remaining balance on principle after $k$ periodic payments have been made.
$ibal_k$	=	Remaining balance on interest after $k$ periodic payments have been made.

$$PMT = PV \left[ \frac{i}{1 - (1+i)^{-n}} \right]$$

$$PV = PMT \left[ \frac{1 - (1+i)^{-n}}{i} \right]$$

$$bal_k = (1+i)^k \cdot \left[ PMT \cdot \frac{(1+i)^k - 1}{i} - PV \right]$$

$$ibal_k = n \cdot PMT + PV - (k \cdot PMT + PV + bal_k)$$



The graph at left shows the relationship between principle and interest in periodic payments. The points on the curve and the areas underneath the curve are computed by the above formulas.

Microsoft Excel also has some built-in functions which computes the values given by the previous formulas. You can either implement the above formulas directly in your spreadsheet or use the built-in financial formulas to construct your spreadsheet. Check out the Help menu items to find out more about financial formulas in Excel.

The rest of this page shows a screen layout for the spreadsheet. Your spreadsheet should look very similar to this. Notice that some of the cells (fields) have constant values (numbers in black) or labels (in *Ariel italic* font), and others are the result of formulas (the numbers in red). Most of the work in developing this application will be needed to enter the proper formulas for the appropriate fields. [The payment breakdown Table, starting at line 16, is actually filled in by writing the proper formulas for the first two rows, then copying and pasting the remaining elements in each column. This table contains the data needed to generate the graph pictured at the top of this page).]

Turn in a printout of your spreadsheet, showing the formulas that are present. Also, bring in your spreadsheet to the lab, so we can verify that all aspects of the assignment work correctly.

**The appearance of the spreadsheet is shown below:**

<i>Loan Data:</i>									
<b>Loan Amount (\$'s):</b>				200,000.00					
<b>Annual Interest Rate (%):</b>		6.25		<i>Monthly Payment=</i>				<b>\$1,231.43</b>	
<b>Payement Period (yrs):</b>		30							
Your monthly payment breaks down as follows:									
=====									
						<i>Accumulated</i>			
<i>Pmt#</i>	<i>Principle</i>	<i>Interest</i>		<i>Principle</i>	<i>Interest</i>		<i>Total Paid</i>		
10	<b>\$198.85</b>	<b>\$1,032.58</b>		<b>\$1,942.78</b>	<b>\$10,371.57</b>		<b>\$12,314.34</b>		
<i>Remaining balance on principle is:</i>				<b>\$198,057.22</b>					
<i>Remaining balance on interest is:</i>				<b>\$232,944.82</b>					