

Math 107 Homework 7 Use spreadsheets to do these problems. On problem 1, turn in a snippet of the first 10 lines of your spreadsheet showing the Balance, the Interest Paid and the Principal Paid on the balance sheet. On problem 8 turn in a spreadsheet with a snippet showing a table similar to one in problem 6. The rest of the problems you can just turn in answers.

Installment Loans - money is borrowed for a fixed period of time, called the **term** of the loan, and the borrower makes **regular payments** (usually monthly, but can be at any fixed interval) to pay off the loan plus interest accumulated during that time. **Interest** is usually calculated using the same fixed interval on the balance still owed (called the **principal**). Every payment is an identical amount, but a portion goes towards the interest owed that month and a portion goes towards the principal (balance) on the loan.

In general, the current balance = previous balance, + interest accrued - payments. It is traditional to list for each month the Balance, the Interest Paid and the Principal Paid on the balance sheet (or amortization table).

1. You borrow \$2,400 to pay for a Caribbean vacation and will pay it off over 2 years with regular monthly payments.
 - a. What is the regular payment if interest is charged on the loan amount at APR of 8%. Interest is charged monthly on the balance still owed.
 - b. What is the total amount of payments made in part a.? What is the total cost of the loan? (The **cost** of the loan is the total amount of interest paid.)
2. You would like to buy a Mazda Miata Convertible for a purchase price of \$27,500. You will take out a loan for the entire amount.
 - a. You have excellent credit so you can secure a loan at 5% APR for 3 years. What is your monthly payment? How much will you pay in interest if you pay off the loan as scheduled?
 - b. Now suppose instead you want to consider a 5 year loan at 6.5% APR. What is your monthly payment? How much will you pay in interest if you pay off the loan as scheduled?
 - c. Compare the cost of the two loans.
3. Suppose you decide to purchase a \$150,000 home for \$20,000 down. A down payment is subtracted from your home's value and therefore you owe \$130,000. To pay for this you will need a \$130,000 loan. Suppose the interest rate on a 30 year mortgage is 4.5%. What will your monthly payment be? How much will you pay on the loan if you pay off the loan as scheduled?
4. Alternatively you decide the most you can afford in a monthly payment for a home is \$750. You plan on taking out a 30 year loan for 4%. How much can you borrow? What is the total amount of home you can afford? (assume the \$20,000 down payment listed above)
5. Comparing a 15 year and 30 year mortgage. Suppose you decide to purchase a house and determine you need \$250,000 loan. You research loan rates and see that you can get either a 15 year loan for 3.5% or a 30 year loan for 4.5%. Determine
 - a. The monthly payment on each loan
 - b. The total amount of interest paid on each loan if you pay off the loan as scheduled.

Credit Cards. Credit cards come with a variety of rules, fees, charges, and terms.

Account Summary	Activity Summary
Minimum Payment Due \$120.12	Previous Balance \$2,023.53
Payment Due Date 10/20/11	- Payments \$25.00
Statement End Date 09/23/11	+ Purchases \$2,697.15
Credit Line \$10,000.00	- Other Credits \$0.00
Credit Available \$5,231.15	+ Balance Transfers \$0.00
Cash Credit Line \$2,000.00	+ Cash Advances \$0.00
Cash Credit Available \$2,000.00	+ Fees Charged \$0.00
Past Due Amount \$0.00	+ Interest Charged \$73.17
Overlimit Amount \$0.00	Statement Balance \$4,768.85

The way in which interest is calculated varies by card, but we'll use the previous balance method.

Current Balance = Previous Balance - Payments + Purchases + Finance Charges

The finance charges are the interest and for the sake of this calculation we have

Finance Charges = $(APR/12) * (\text{Previous Balance} - \text{Payments} + \text{Purchases})$

6. For the above credit card with an APR of 24%, assume you pay \$150 per month and make no additional purchases. How long will it take you to pay off the balance? What will the last payment be? Note: The Previous balance is now \$4768.85.

Month	Previous Balance	Payments	Purchases	Finance Charge	New Balance
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7. You have a credit card with an APR of 24%. The minimum payment is 5% of the outstanding balance (but no less than \$20). Suppose you have \$2000 on the card and you decide to stop charging and pay it off using the minimum payment each month. Use a spreadsheet
 - a. Now bring this down to determine when the card is paid off – what is the total amount you paid in interest?
8. Suppose your Master Card Charges an APR of 16.5%. Your previous statement showed a balance of \$600, you made a payment of \$200. You then bought \$350 worth of electronics, which you charged on your Master Card. Let's make a spreadsheet
 - a. Suppose in the second month you make a payment of \$250 and then go make purchases of \$460. Complete the second month of the spreadsheet.
 - b. Suppose in the third month you make a payment of \$175 and then make purchases of \$55 and \$120. Complete the third month of the spreadsheet.