Mathematical Concepts — Joysheet 4 MAT 117, Spring 2011 — D. Ivanšić	Name: A solution
	Show all your work!

This is an exercise in computing the payment on a hypothetical loan and comparing it with the numbers that financial services websites give you. Do the following:

1. (4pts) Decide on an amount and purpose for a hypothetical loan (e.g. buying a car, house, starting a business, etc.) Choose over how many years it should be repaid. Standard choices for each category are suggested: 15, 20, 30 years for a home, 3, 4, 5 years for a car, etc.

Buying a home for $179,000, repaid over 20 years

2. (14pts) Find a financial services website that computes a monthly payment based on a loan amount. Many banks' or mortgage originators' websites have mortgage calculators, for example. Use their calculator and the actual interest rate that they offer to find the monthly payment on your hypothetical loan. Print out the webpage, showing loan amount, term, interest rate and payment and attach it to this one. Try to keep it to just one sheet.

(Attachment)

3. (12pts) Using our loan formula from 3.5, compute (write the computation here) the monthly payment on your hypothetical loan. Use the interest rate that you found on the website. The frequency of compounding is typically monthly. Does your number agree with the information on the website you found?

$$r = 4.75\%$$

$$240$$

$$179{,}000 = m \cdot \frac{1 - \left(1 + \frac{0.0475}{12}\right)^{-12 \cdot 20}}{\frac{0.0475}{12}}$$

$$179{,}000 = m \cdot 154.745\ldots$$

$$m = \frac{179{,}000}{154.745\ldots} = 1156.74$$

agrees with website

4. (14pts) Find the balance of the hypothetical loan after two thirds of all payments have been made.

$$P = 1156.74 \cdot \frac{1 - \left(1 + \frac{0.0475}{12}\right)^{-80}}{\frac{0.0475}{12}}$$

$\frac{2}{3} \cdot 240 = 160$

80 payments remain

$= 1156.74 \cdot 68.455\ldots$

$= 79,185.56$

5. (16pts) Write an amortization schedule for the four payments after two thirds of all payments have been made. (For example, if it's a 60-month loan, consider payments 41, 42, 43 and 44.)

payment no.	Payment	toward interest	toward principal	balance
160	1156.74	—	—	79,185.56
161	1156.74	313.44	843.30	78,342.26
162	1156.74	310.10	846.64	77,495.62
163	1156.74	306.75	849.99	76,645.63
164	1156.74	303.39	853.35	75,792.28

Today's Rates

Rates as of Mon 03/07/2011 09:49 AM ET

Here are today's best rates for:

Rates as low as 3.375%

Here are the rates that best match your information

If you want to see information about additional products, you can add them below. Added product information will automatically update in this window.

	Monthly Payment	Rate %	Points %	APR %		Lender Fees
30-Year Fixed Rate	$933.75	4.750	1.500	4.922		View
20-Year Fixed Rate	$1,156.74	4.750	1.000	4.924		View
5-Year ARM	$791.35	3.375	1.125	3.265	(Variable)	View
30-Year Fixed Rate, interest only	$801.77	5.375	1.500	5.530		View
5-Year ARM, interest only	$540.73	3.625	0.875	3.290	(Variable)	View

These rates were obtained using information you provided and assume you have good credit and set up a tax & insurance escrow account. This is not a credit decision or a commitment to lend; credit is subject to approval. Monthly payment and interest rate are for illustrative purposes only and may vary based on borrower's credit score, actual closing costs and other variables. Additional programs may be available. Depending on your situation, mortgage insurance may be needed which could increase the monthly payment and APR.

Add a Product: 30-Year Fixed Rate

Add

- Finance type:
- Purchase

- Lock period:
- 60

- State:
- KY

- Loan Amount:
- $179,000.00

Loan Assumptions