

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.

Refinance a \$160,000 mortgage
over 20 years, interest rate 3.75%

2. (14pts) Find a financial services website (bank, mortgage originator) that gives you interest rate quotes for the kind of loan that you chose and computes the monthly payment based on a loan amount. Use their computation to find the monthly payment on your hypothetical loan. **Don't use a website with a "generic" calculator such as bankrate.com, rather, find one that offers actual loans with current interest rates.** 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 8.5, 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?

$$P = PMT \frac{1 - \left(1 + \frac{r}{n}\right)^{-nt}}{\frac{r}{n}}$$

$$160,000 = PMT \frac{1 - \left(1 + \frac{0.0375}{12}\right)^{-12 \cdot 20}}{\frac{0.0375}{12}}$$

$$160,000 = PMT \cdot 168.66\dots$$

$$PMT = \frac{160,000}{168.66\dots} = 948.62, \text{ amount agrees with website}$$

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

$$P = PMT \frac{1 - (1 + \frac{r}{n})^{-4t}}{\frac{r}{n}}$$

time remaining
↓
~~4~~
 $\frac{20}{3}$

$$P = 948.62 \cdot \frac{1 - (1 + \frac{0.0375}{12})^{-12 \cdot \frac{20}{3}}}{\frac{r}{n}}$$

$$= 948.62 \cdot 70.68 \dots$$

$$= 67,054.71 \text{ is the balance after 160 payments } (\frac{2}{3} \text{ of } 240)$$

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.)

(948.62 always)

payment no	to. interest	to. principal	balance
160			67,054.71
161	209.55	739.07	66,315.64
162	207.24	741.38	65,574.26
163	204.92	743.70	64,830.56
164	202.60	746.02	64,084.54

Calculations:

$$67,054.71 \cdot 0.0375 \cdot \frac{1}{12} = 209.55$$

For payment 161:

$$948.62 - 209.55 = 739.07$$

$$67,054.71 - 739.07 = 66,315.64 \text{ etc.}$$

Your monthly payment varies depending on loan type and terms.

Rates as of Wed 10/10/2012 09:28 AM ET

Today's best rates based on the information you provided:

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
30-year fixed rate	\$740.98	3.750%	1.000	3.895%
15-year fixed rate	\$1,104.93	3.000%	1.125	3.278%
20-Year Fixed Rate	\$948.62	3.750%	1.125	3.967%
7/1 ARM	\$653.19			
(adjustable-rate mortgage) During the initial 7-year fixed-rate period				
		2.750%	0.750	3.143% variable
5/1 ARM	\$611.59			
(adjustable-rate mortgage) During the initial 5-year fixed-rate period				
		2.250%	1.125	3.057% variable

[Loan assumptions](#)

Interest rates, APR and monthly payments were obtained using information you provided, assume you have good credit and set up a tax and insurance escrow account, are for informational purposes only and are subject to change without notice. This is not a credit decision or a commitment to lend. Monthly payment shown includes principal and interest only and may vary based on borrower's credit score, actual closing costs and other variables. Tax and insurance and other fees are not included in the displayed monthly payment and will result in a higher actual monthly payment. Depending on your situation, mortgage insurance may be needed which could increase the monthly payment and APR. Review the Loan Assumption link for information about the loan parameters used to calculate the loan information shown above. Additional loan programs may be available.

Add a product:

Add

- Finance type:
 - Refinance

- Lock period:
 - 90

- State:
 - KY

- Loan amount:
 - **\$160,000.00**