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.

Refinancing a mortgage. Loan of $190,000
for 15 years
$r = 2.375\%$

2. (14pts) Find a financial services website (bank, mortgage originator) that gives you interest rate quotes for the kind of loan that you chose in problem 1 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?

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

$$190,000 = PMT \cdot \frac{1 - \left(1 + \frac{0.02375}{12}\right)^{-12 \cdot 15}}{\frac{0.02375}{12}}$$

$$190,000 = PMT \cdot 151.3...$$

$$PMT = \frac{190,000}{151.3...} = 1255.75 \qquad \text{(agrees with website)}$$

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

$$P = PMT \frac{1-\left(1+\frac{r}{n}\right)^{-nt}}{\frac{r}{n}} = 1255.75 \cdot \frac{1-\left(1+\frac{0.02375}{12}\right)^{-12 \cdot 5}}{\frac{0.02375}{12}} \quad \text{time remaining}$$

$\frac{2}{3}$ of 15 years is 10 years

$= 1255.75 \cdot 56.52 ..$

$= 70,977.21$

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.)

No.	Payment	Toward Interest	Toward Principal	Balance
120				70,977.21
121	1255.75	140.48	1115.27	69,861.94
122	1255.75	138.27	1117.48	68,744.46
123	1255.75	136.06	1119.69	67,624.77
124	1255.75	133.84	1121.91	65,502.86

Calculation For Payment no 121: $70,977.21 \cdot \frac{0.02375}{12} = 140.48$

$1255.75 - 140.48 = 1115.27$

$70,977.21 - 1115.27 = 69,861.94$

Menu ⌄

(Bank of America website)

What are your home loan goals?

I want to...

Let us help find the home loan that's right for you

Mortgages	**Refinancing**	Home Equity

Refinance your mortgage with our low refinance rates — and potentially lower your monthly mortgage payment

Get started   Learn more

or

Talk to a lending specialist at 800.763.4820 or schedule an appointment

Today's low refinance rates†

Rates based on a **$190,000** loan in ZIP code **42071**

Home value *

$ 250000

Estimate your home value

Current loan balance *

$ 190000

Balance left on your mortgage

ZIP code *

42071

Update rates

	30-year fixed	15-year fixed	5y/6m ARM variable
Rate	3.000%	2.375%	2.125%
APR	3.107%	2.579%	2.669%
Points	0.477	0.557	0.837
Monthly payment	$801	$1,256	$714
			About ARM rates

Refinance rates valid as of 15 Oct 2021 09:34 a.m. Central Daylight Time and assume borrower has excellent credit (including a credit score of 740 or higher). Estimated monthly payments shown include principal, interest and (if applicable) any required mortgage insurance. ARM interest rates and payments are subject to increase after the initial fixed-rate period (5 years for a 5y/6m ARM, 7 years for a 7y/6m ARM and 10 years for a 10y/6m ARM). Select the **About ARM rates** link for important information, including estimated payments and rate adjustments.

Loan assumptions and disclosures

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