Scholarship of Excellence in Teaching: Excel Payment Calculations

Karen Penn de Martinez

Professor, Computer Applications

Goal: Help students understand and successfully utilize payment calculations

▶ Few students in my course have personal experience with interest-bearing loans

▶ I want them to understand how to calculate a loan and to avoid predatory loans for themselves and their friends/family/community

▶ In past semesters, their car loan calculations often contained errors that resulted in incomplete, incorrect, or even absurd payment amounts

	Option 1	Option 2
Amount of loan	$19,299	$17,100
Annual interst rate	2.99%	4.50%
Number of years	4	5
Monthly interest rate	0.002491667	0.00375
#of months	48	60
Monthly payment	($427.09)	($3,895.24)
Total paid	($20,500.08)	($233,714.22)

⇐ Used annual, not monthly interest and # of payments

How to Be an Antiracist by Ibram Kendi Influenced the Lesson

▶ Kendi argues that it is insufficient (and nearly impossible) to "not be a racist" in our society. We must actively work against racist practices and systems.

▶ I have long worried that Montgomery College students and their families are likely to be victimized by exploitative lending, and I have taught the PMT function as a tool to analyze loan costs. However, students treated the lesson as an academic exercise rather than a life-skill for themselves or their communities.

▶ Kendi's analysis prompted me to focus less on the "limited financial skills and knowledge" of MC students and refocus the lesson on the systemic racism and abusive lending practices that frequently target marginalized communities.

The Miniature Guide to Critical Thinking by Richard Paul and Linda Elder Influenced the Lesson

- Paul and Elder argue that "all reasoning leads somewhere or has implications or consequences"

- If students have to post their thoughts and responses to articles about systemic racism in finance and lending, will they advocate for systemic change?

- Will the application of the Excel payment function make more sense to them and result in more correct calculations?

- If their critical thinking about predatory lending activates their successful application of the PMT function, they might be better able to help themselves and their community members avoid financial exploitation.

Strategy: Discussion Jigsaw Prior to Lesson on the Function

▶ Added a discussion board topic where students shared insights from articles (below) on abuses and systemic racism in lending

▶ Jigsaw of 4 articles summarized, respond to another student's summary

▶ This generated better discussion (and some friend/family examples) of predatory lending

Based on the first letter of your last name, read the article assigned below:

- If your last name starts with A through H, read: https://www.marketwatch.com/story/do-car-dealerships-discriminate-against-some-races-2018-01-11
- If your last name starts with I through M, read: https://www.cnbc.com/2019/07/27/how-the-student-debt-crisis-has-hit-black-students-especially-hard.html
- If your last name starts with N through P, read: https://www.debt.org/credit/predatory-lending/
- If your last name starts with Q through Z, read: https://www.pewresearch.org/fact-tank/2017/01/10/blacks-and-hispanics-face-extra-challenges-in-getting-home-loans/

By 10/15, in the Discussion board topic LOANS, post a brief summary of the article you read (100-300 words – be sure to include the article title), along with your own thoughts about how the article relates to social justice, financial success, or systemic racism.

By 10/19, post a response (50-150 words) to someone else's comments. In your response, suggest what you think should be done to address the issues mentioned in the post. Would education help? Do we need to protest or vote to change the laws? Can you think of financial solutions to some of the concerns? If you don't have a lot of experience with borrowing money, I encourage you to ask parents or friends to share their thoughts about loans, debt, and finances so we can learn from our wider community.

Taught the Function, HW Asked Students to Advise a Friend on the Better of 2 Loans:

JUAN'S CAR LOAN

Your friend, Juan, is planning to buy a new car, which costs $20,619. Juan has a job that pays pretty well and a good credit record, but he's never bought a car before, and he doesn't want to get ripped off. The car dealer is offering him a choice of two promotions:

> 1) 2.95% annual financing of the full price for a 4 year-long loan.

> OR

> 2) A $2,200 "rebate" or discount, which would reduce the price of the car by $2,200. If he took the rebate, Juan could get a loan from his credit union for the discounted price at a 4.29% annual rate over a 5-year period.

Juan doesn't know how to use Excel, so he has asked you to help him figure out which of these two options is the better deal. He wants to know how much his monthly payment would be for each, but he also wants to make sure he doesn't take a lower monthly payment that ends up costing more in the long run.

Create a spreadsheet to advise Juan which of the two offers above he should choose.

1. Use the =PMT function to figure out how much the monthly payment would be for each option. Also, figure out how much Juan would spend over the life of each loan. Hint: if the monthly payments are more than $600, you've done something wrong – probably forgotten to include the 12 months per year in the math!

2. Label all the cells clearly so that Juan can see what each number represents for both loan options.

3. In cell A1, insert a function that shows the current date (and will update if you open the file next week). In B1, type your name.

4. At the bottom, merge several cells together and wrap the text within the cells so you can write a brief paragraph to Juan. Clearly explain which loan you recommend and why it is a better deal. Make sure all the paragraph text is visible.

Assessment – What Were the Results?

▶ The Covid term makes comparison with last year somewhat apples to oranges. Students can get tutoring for homework, and completion rates vary. Currently using take-home final exams.

▶ Looking back at last fall, there weren't as many incorrect functions in homework as I thought there were! This fall, though, there were still errors on the calculations and some unreasonable results.

▶ Discussions, however, indicated heightened awareness of the dangers of exploitative lending and concern about systemic racism in supposedly "impartial" lending processes.

As a black woman...I was especially surprised and hurt to see the ratio of overcharging for minorities, even when they had a better credit score and made more money than their white counterparts.

Something that can be done to avoid predatory lending is being educated with borrowing money. I think from high school to college people should learn how to look for loans with low interest rates and to read over documents regarding borrowing money

What Next?

▶ I will continue to precede the payment calculation assignment with the discussion board.

▶ In an effort to address the calculation errors, I have redesigned this and other homework instructions to alert students, in a stepwise process, where they may be running into errors.

Create a spreadsheet to advise Juan which of the two offers above he should choose.

1.	☒	Use the =PMT function to figure out how much the monthly payment would be for each option.
2.	☐	**Are the monthly payments more than $600?** If so, there must be an error in your calculation – go back and make sure you included the 12 months per year in your formulas!
3.	☐	Write formulas to figure out how much Juan would spend, total, over the life of each loan.
4.	☐	**Is the total more than $30,000? If so, something's wrong in the formulas or numbers used!** Paying interest for 30 years on a home loan could legitimately double the price, but not on a 4- or 5-year car loan!
5.	☐	Label all the cells clearly so that Juan can see what each number represents for both loan options.

Appreciation:

- Thank you so much Joan for your always-positive tone and support!
- Thanks to my brilliant SET colleagues for the valuable insights and community.
- Congrats all!