**COMPOUND STUDENT INTEREST**

**USING ALGEBRA-BASED FINANCIAL APPLICATIONS**

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**DO NOW: What's The Story?**

**Context: Mortgages**

**Examine these two spreadsheets.**

**What story do they individually tell? Together, what story do they tell?**

**A table of numbers and a number of payments

Description automatically generated with medium confidence**

**DO NOW: What's The Story?**

**Context: Automobile Expense and Depreciation**

**Examine this system of 2 linear equations.**

**What story does the expense equation tell?**

**What story does the depreciation equation tell?**

**Together, what story do the two equations tell?**

**A graph of car depreciating equation

Description automatically generated**

**DO NOW: What's The Story?**

**Context: Federal Income Taxes**

**Examine the tax tables below. What story do they individually tell?**

**Together, what story do they tell?**

A white paper with numbers and a black text

Description automatically generated**A table with numbers and a few words

Description automatically generated with medium confidence**

**GUIDED DISCOVERY**

**STUDENT LOAN CONSOLIDATION**

*Mateo has two federal unsubsidized student loans. He has made interest-only payments on the loans while in school. For loan #1, he has a balance of $12,400 with 8 years remaining on the loan at an interest rate of 5.3%. For loan #2, he has a balance of $6,400 with 4 years remaining at an interest rate of 4.2%. Mateo is considering federal consolidation of these two loans.*

A math formula with a square and a number of equations

AI-generated content may be incorrect.

\*Round all monetary answers to the nearest cent.

**The Original Loans**

* What is the current monthly payment for loan #1? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* What is the current monthly payment for loan #2? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* During the overlapping 4-year payment period, what is the combined monthly payment for the two loans?\_\_\_\_\_\_\_
* Calculate the total amount to be paid for loan #1.\_\_\_\_\_\_\_\_ (# months X monthly payment)
* Calculate the total interest to be paid for loan #1.\_\_\_\_\_\_\_\_(total paid – principal)
* Calculate the total amount to be paid for loan #2. \_\_\_\_\_\_\_\_ (# months X monthly payment)
* Calculate the total interest to be paid for loan #2.\_\_\_\_\_\_\_\_\_ (total paid – principal)

**The Consolidated Loan**

* For each loan, multiply the remaining principal times the interest rate (expressed as a decimal). This is the loan weight factor.

Loan #1 – \_\_\_\_\_\_\_\_\_\_\_\_Loan #2 – \_\_\_\_\_\_\_\_\_\_\_\_

* Find the sum of the two weight factors (***wf***). \_\_\_\_\_\_\_\_
* The consolidated principal (***cp***) is the sum of the two remaining principals. What is that amount? ***cp*** = \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Find 100 times the quotient of the sum of the weight factors and the consolidated principal (***wf/cp***) rounded to nearest tenths place. \_\_\_\_\_\_\_\_ This is the weighted average of the interest rates.
* Round this answer UP to the nearest eighth of a percent. \_\_\_\_\_\_ This is the consolidated loan interest rate.
* The federal government uses this chart to set the consolidated loan length. What is the new loan length? \_\_\_\_\_

**TOTAL LOAN DEBT REPAYMENT PERIOD**

**$0 - $7500 10 years**

**$7500 - $10000 12 years**

**$10000 - $20000 15 years**

**$20000 - $40000 20 years**

**$40000 - $60000 25 years**

**$60000 or more 30 years**

* The new monthly payment will be \_\_\_\_\_\_\_.

**Conclusions**

* Is consolidation the right choice? Make a case for or against this loan consolidation based on your calculations.

**GUIDED DISCOVERY**

**STUDENT LOAN CONSOLIDATION**

*Mateo has two federal unsubsidized student loans. He has made interest-only payments on the loans while in school. For loan #1, he has a balance of $12,400 with 8 years remaining on the loan at an interest rate of 5.3%. For loan #2, he has a balance of $6,400 with 4 years remaining at an interest rate of 4.2%. Mateo is considering federal consolidation of these two loans.*

A math formula with a square and a number of equations

AI-generated content may be incorrect.

\*Round all monetary answers to the nearest cent.

**The Original Loans**

* What is the current monthly payment for loan #1? $158.76
* What is the current monthly payment for loan #2? $145.08
* During the overlapping 4-year payment period, what is the combined monthly payment for the two loans? $303.84
* Calculate the total amount to be paid for loan #1. $15,240.96 (# months X monthly payment)
* Calculate the total interest to be paid for loan #1. $2,840.96 (total paid – principal)
* Calculate the total amount to be paid for loan #2. $6,963.84 (# months X monthly payment)
* Calculate the total interest to be paid for loan #2. $563.84 (total paid – principal)

The Consolidated Loan

* For each loan, multiply the remaining principal times the interest rate (expressed as a decimal). This is the loan weight factor.

Loan #1 – 657.2 Loan #2 – 268.8

* Find the sum of the two weight factors (***wf***). 926
* The consolidated principal (***cp***) is the sum of the two remaining principals. What is that amount? ***cp*** = $18,800
* Find 100 times the quotient of the sum of the weight factors and the consolidated principal (***wf/cp***) rounded to nearest tenths place. 4.9 This is the weighted average of the interest rates.
* Round this answer UP to the nearest eighth of a percent. 5%. This is the consolidated loan interest rate.
* The federal government uses this chart to set the consolidated loan length. What is the new loan length? 15 years

**TOTAL LOAN DEBT REPAYMENT PERIOD**

**$0 - $7500 10 years**

**$7500 - $10000 12 years**

**$10000 - $20000 15 years**

**$20000 - $40000 20 years**

**$40000 - $60000 25 years**

**$60000 or more 30 years**

* The new monthly payment will be 148.67

Conclusions

* Is consolidation the right choice? Make a case for or against this loan consolidation based on your calculations.

This question is purposefully open ended.

Some students might base a conclusion on the fact that the new monthly payment is indeed less than the combined monthly payments of the two loans in the overlapping period. Others might calculate the total interest on the consolidated loan and compare it with the combined interest on the original loans. The answer to this question depends on the personal situation of the student borrower. Is a lower monthly payment now, worth a higher interest payment in the long run?