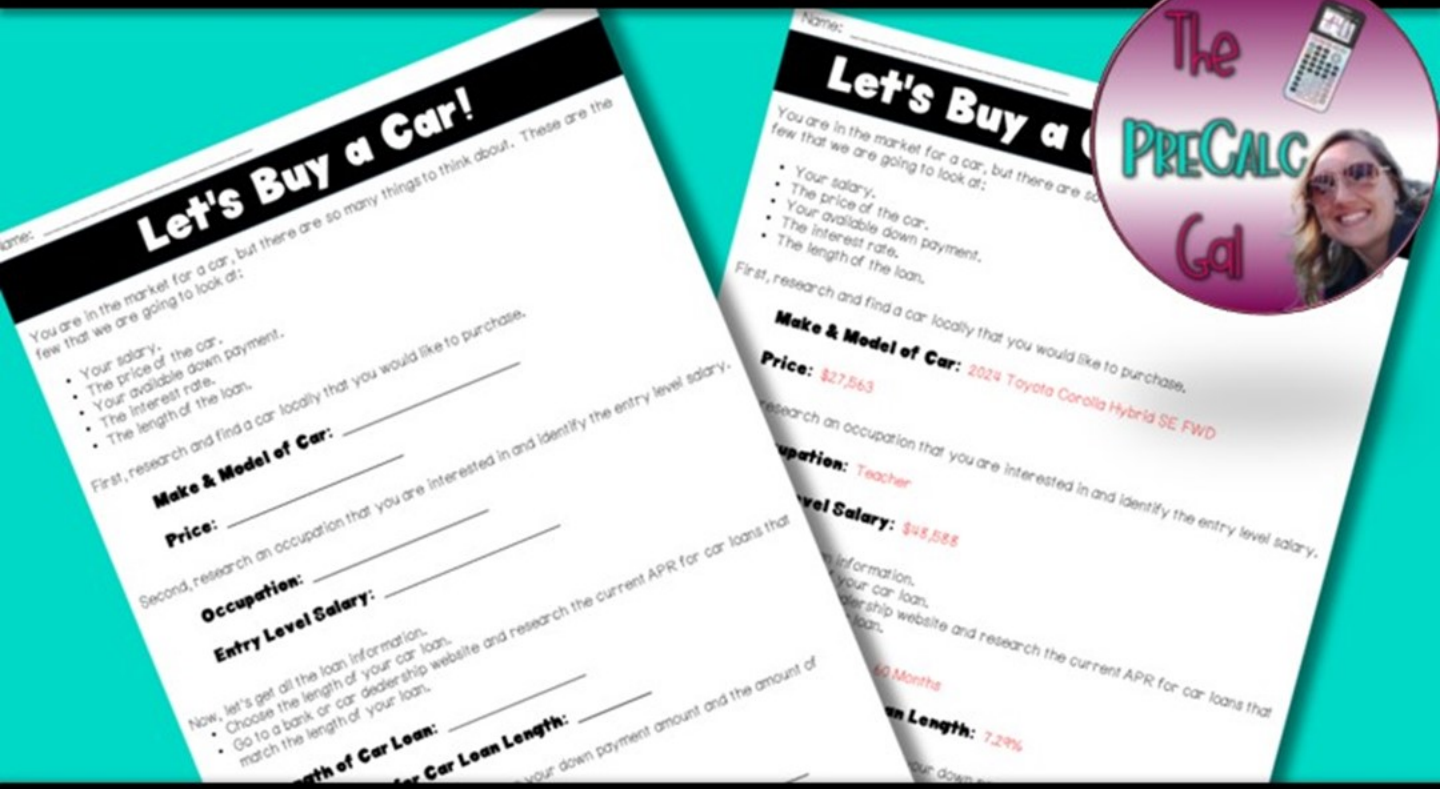
Let's Buy a Car Activity



Financial Literacy & TVM Solver

Using the TMV Solver!

TVM Solver...Teacher Information

The time value of money solver application can be used to solve for different unknowns in compound interest and annuity situations. For any problems that ask to solve for an interest rate, ending amount in an account, starting amount in an account, etc. can all be done using the TVM Solver. This resource extends those ideas to calculating a car payment.

In this resource, the focus will be on using a TI Graphing Calculator, but there are other TI models that have these same abilities. You just need a calculator with finance capabilities.

The next couple of pages will walk you through how to find the TVM Solver on the graphing calculator, what the different variables stand for and how to input the information. Then, there are 4 quick examples to practice using the TVM Solver (including solutions), before a student activity about purchasing a car.

© Michelle DiGiovanni, 2024

TVM Solver

To use the Time Value of Money Solver (TMV Solver)...

Step 1: From the home screen, hit the apps key and choose 1. Finance.

Step 2: Choose the TVM Solver...

This is the TVM Solver Screen...

TVM Solver

Understanding the TVM Solver...

N: The total number of periods.

- When used for payments (such as calculating car payments),

N = 12 X the number of years.

-When used for compound interest (such as saving accounts),

N = the number of compounding periods in a year X the number of years.

I: The interest rate. This should be typed in as a percent.

PV: Present Value. This is the present value of the account or the amount of a loan. This amount should be entered as a negative number since this is money you are 'losing' by depositing into an account.

PMT: Payment. This is only used when calculating payments, like car payments or mortgage payments. When not calculating a payment, leave it as 0.

FV: Future Value. This represents the value of an account after a period of time, such as calculating the account balance after a certain amount of time.

P/Y: Payments per year. For compound interest, this is the number of times interest is paid in a year. For car/mortgage payments, this would be set to 12 for monthly payments.

C/Y: Compounding period per year. For compound interest, this is the number of times the interest is compounded in a year. For car/mortgage payments, this would be set to 12 for monthly payments.

To solve for one of the Variables: Enter the know information and then move the cursor to the variable you are wishing to solve for. Then press **ALPHA ENTER** to **SOLVE.**

Name: _____

TVM Solver Examples

1. You are opening a saving account that compounds monthly at a rate of 4.25%. If you open the account with $2500, how much will be in the account in 4 years?

---

2. You opened a savings account that compounds weekly with $3000 seven years ago. Now, there is $4810.52 in the account. The problem is, you can't remember what interest rate the bank is giving you! Determine the rate.

TVM Solver Examples

3. When you were born, your parents opened a savings account for you. They found an account that had an interest rate of 3.6% compounded quarterly. 18 years after opening the account, there is now $19,061.80 in the account. How much did you parents open the account with?

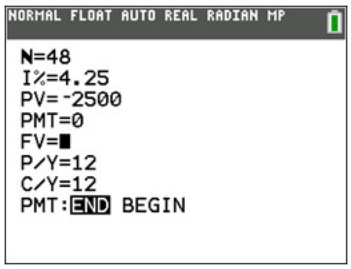
---

4. You are looking to buy your first house. You have found a house for $255,000. You have a down payment of 10%, so your your loan will be for $229,500 (255,000 * 0.10 = $25,500 then 255,000 – 25,500 = $229, 500). Your bank is offering a 30-year fixed mortgage with an interest rate of 6.7%. What would your monthly payment be (excluding taxes and insurance)?

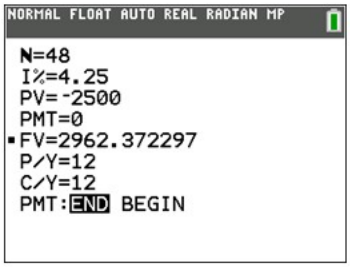
TVM Solver Examples ANSWERS

1. You are opening a saving account that compounds monthly at a rate of 4.25%. If you open the account with $2500, how much will be in the account in 4 years?

Given Information: N = 12 X 4 (compounded monthly – 12 for 4 years)
I = 4.25 (Interest rate of 4.25%)
PV = -2500 (opening the account with $2500)
P/Y = 12 (compounded monthly)
C/Y = 12 (compounded monthly)



Scroll so cursor is on FV, then hit **ALPHA ENTER**.

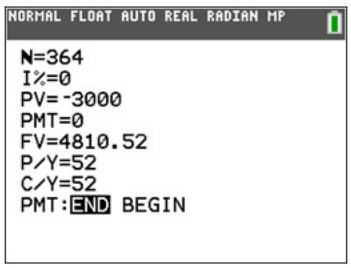


The account will have $2962.37 after 4 years.

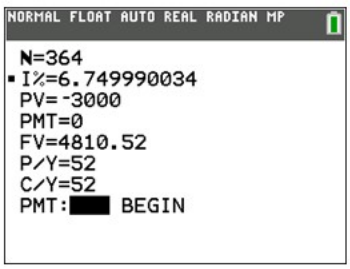
---

2. You opened a savings account that compounds weekly with $3000 seven years ago. Now, there is $4810.52 in the account. The problem is, you can't remember what interest rate the bank is giving you! Determine the rate.

Given Information: N = 52 X 7 (compounded weekly – 52 for 7 years)
PV = -3000 (opened the account with $3000)
FV = 4810.52 (amount now in the account)
P/Y = 52 (compounded weekly)
C/Y = 52 (compounded weekly)



Scroll so cursor is on I%, then hit **ALPHA ENTER**.

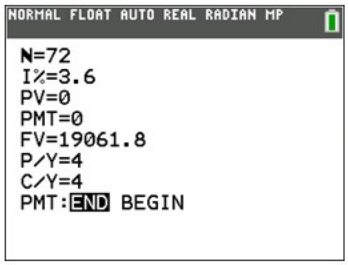


The account has an Interest Rate of 6.75%

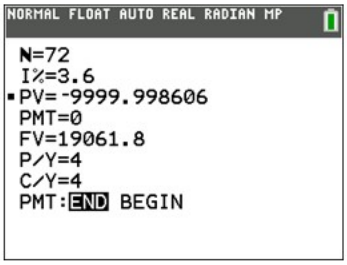
TVM Solver Examples ANSWERS

3. When you were born, your parents opened a savings account for you. They found an account that had an interest rate of 3.6% compounded quarterly. 18 years after opening the account, there is now $19,061.80 in the account. How much did you parents open the account with?

Given Information: N = 4 X 18 (compounded quarterly – 4 for 18 years)
I = 3.6 (Interest Rate of 3.6%)
FV = 19061.80
P/Y = 4 (compounded quarterly)
C/Y = 4 (compounded quarterly)



Scroll so cursor is on PV, then hit **ALPHA ENTER**.

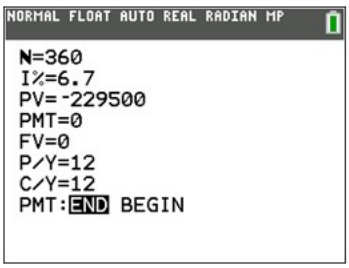


The account was opened with $10,000.

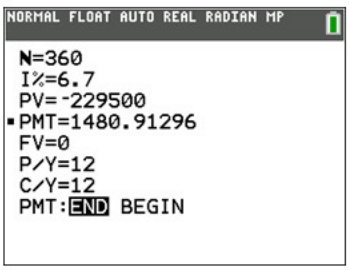
---

4. You are looking to buy your first house. You have found a house for $255,000. You have a down payment of 10%, so your your loan will be for $229,500 (255,000 * 0.10 = $25,500 then 255,000 – 25,500 = $229, 500). Your bank is offering a 30-year fixed mortgage with an interest rate of 6.7%. What would your monthly payment be (excluding taxes and insurance)?

Given Information: N = 12 X 30 (monthly payments for 30 years)
I% = 6.7 (Interest Rate of 6.7%)
PV = -229500 (loan amount of $229,500)
P/Y = 12 (monthly payments)
C/Y = 12 (monthly payments)



Scroll so cursor is on PMT, then hit **ALPHA ENTER**.



The monthly payment (excluding taxes and insurance) would be $1480.91.

Let's Buy a Car! Teacher Directions

This resource can be used as a financial literacy project, calculator practice, compound interest practice or everything in between.

This activity has students research:

- Cars and their prices
- Careers and their salaries
- Auto loan rates

There are some calculations that will need to be made, such as the amount of the down payment, as well as their monthly salary with certain percents, as well as using a TVM Solver.

At the end of the activity, students reflect on whether they could actually afford the car they were purchasing based on their salary.

If your students are unable to research the above, the teacher could provide options for students to pick from randomly or have available around the room.

Down payment options are provided. They can be printed and cut out. Then students could either pick them from a hat or the teacher can pass them out randomly.

The length of the car loan options have also been provided. Just like the down payment options, they can be printed out and cut, given to students however the teacher sees fit.

This activity could be turned into a presentation, poster or even altered to be done with purchasing a home (you wouldn't be able to use the worksheet though).

© Michelle DiGiovanni, 2023

Name: _____

Let's Buy a Car!

You are in the market for a car, but there are so many things to think about. These are the few that we are going to look at:

- Your salary.
- The price of the car.
- Your available down payment.
- The interest rate.
- The length of the loan.

First, research and find a car locally that you would like to purchase.

Make & Model of Car: _____

Price: _____

Second, research an occupation that you are interested in and identify the entry level salary.

Occupation: _____

Entry Level Salary: _____

Now, let's get all the loan information.

- Choose the length of your car loan.
- Go to a bank or car dealership website and research the current APR for car loans that match the length of your loan.

Length of Car Loan: _____

Current APR for Car Loan Length: _____

Continuing to look at your loan, determine your down payment amount and the amount of your loan.

Down Payment %: _____

Calculated Down Payment Amount: _____

Loan Amount: _____

© Michelle DiGiovanni, 2023

Name: _____

Let's Buy a Car!

Now, use your calculator's Time Value of Money App (TVM Solver) to calculate your car payment! Please fill out the chart below showing what you entered into the calculator.

N =
I % =
PV =
PMT = This should be left blank as this is what you are calculating!
FV =
P/Y =
C/Y =

Monthly Car Payment: _____
Payment doesn't include tax, title, license or other fees.

Typically, your car payment should be about 10 – 15% of your monthly salary. Let's see if you can actually afford your car!

Entry Level Salary: _____

Monthly Salary: _____

10% of Monthly Salary: _____

15% of Monthly Salary: _____

1. Can you afford your car?

2. Could there have been easy changes to make your car affordable? (i.e. Slightly increase your down payment, change the length of your loan, etc.) Or would you need to find a more affordable vehicle?

© Michelle DiGiovanni, 2023

Name: _____

Let's Buy a Car! Example

You are in the market for a car, but there are so many things to think about. These are the few that we are going to look at:

- Your salary.
- The price of the car.
- Your available down payment.
- The interest rate.
- The length of the loan.

First, research and find a car locally that you would like to purchase.

Make & Model of Car: 2024 Toyota Corolla Hybrid SE FWD

Price: $27,563

Second, research an occupation that you are interested in and identify the entry level salary.

Occupation: Teacher

Entry Level Salary: $48,588

Now, let's get all the loan information.

- Choose the length of your car loan.
- Go to a bank or car dealership website and research the current APR for car loans that match the length of your loan.

Length of Car Loan: 60 Months

Current APR for Car Loan Length: 7.29%

Continuing to look at your loan, determine your down payment amount and the amount of your loan.

Down Payment %: 10% Down Payment

Calculated Down Payment Amount: 27563 * 0.10 = $2756.30

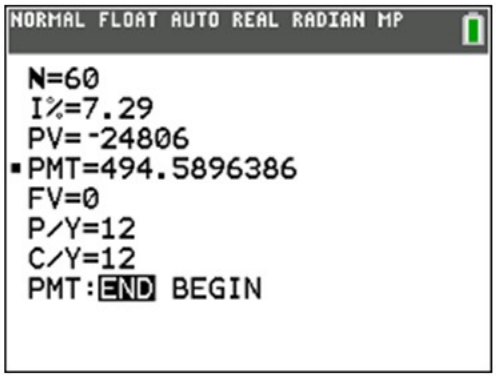
Loan Amount: 27563 – 2756.30 = $24806.70

© Michelle DiGiovanni, 2023

Name: _____

Let's Buy a Car! Example

Now, use your calculator's Time Value of Money App (TVM Solver) to calculate your car payment! Please fill out the chart below showing what you entered into the calculator.



Monthly Car Payment: $494.60

Payment doesn't include tax, title, license or other fees.

Typically, your car payment should be about 10 – 15% of your monthly salary. Let's see if you can actually afford your car!

Entry Level Salary: $48,588

Monthly Salary: $48,588/12 = $4049

10% of Monthly Salary: $4049 * 0.10 = $404.90

15% of Monthly Salary: $4049 * 0.15 = $607.35

1. Can you afford your car?

2. Could there have been easy changes to make your car affordable? (i.e. slightly increase your down payment, change the length of your loan, etc.) Or would you need to find a more affordable vehicle?

© Michelle DiGiovanni, 2023

Down Payment Options

No Down Payment	1% Down Payment
3% Down Payment	5% Down Payment
10% Down Payment	20% Down Payment
No Down Payment	1% Down Payment
3% Down Payment	5% Down Payment
10% Down Payment	20% Down Payment
No Down Payment	1% Down Payment
3% Down Payment	5% Down Payment
10% Down Payment	20% Down Payment

© Michelle DiGiovanni, 2023

Length of the Car Loan

36 Months	48 Months
60 Months	72 Months
36 Months	48 Months
60 Months	72 Months
36 Months	48 Months
60 Months	72 Months
36 Months	48 Months
60 Months	72 Months

© Michelle DiGiovanni, 2023

The PreCalc Gal

Want to hear tips and tricks for the classroom, as well as, get some freebies?

Then click below to join my email list!

Thank you!

I always love hearing feedback on my resources. Rating and reviewing my product is the best way to say thank you to me. And as a thank you to you, TPT will give you credit towards future purchases!

Fonts, Clip Art & Templates By...

Image(s) may be under license from www.freepik.com or pixabay.com