Name: _____

Date: _____

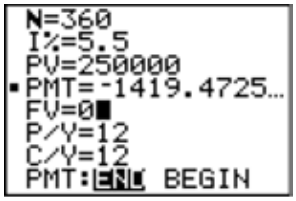
Interest Packet #1

(Use a highlighter for important numbers)

Explore the TVM Solver (TVM = Time, Value, Money)

2nd FINANCE, 1: TVM Solver... on the TI 83, Apps 1:FINANCE on the TI 83+/84

N = The number of total periods for compounding
I% = the interest rate (usually an annual rate)
PV = Present value
PMT = the periodic payment
FV = Future value
P/Y = Payments periods per year
C/Y = Compounding periods per year



Fill in the blanks, using the information above:

Ex. Find your mortgage payment = **$1419.47** for a **$250,000** Loan
N = 360 pay periods = **30 years** years (360 × 12)

Let's Play!

You cannot leave a value blank. There must be a value in every place.

ALPHA SOLVE for PV. Present Value

1. If you have $1000 down payment, $250/month to buy a car for a 5 year loan at 9.4%?, How much can you afford?
   Set up the TVM Solver:
   Move the cursor over PV
   (Note that outflows are negative)
   While the cursor is flashing on the PV, press ALPHA SOLVE (enter)

   Why does N = 60? **Because 12 x 5 = 60.**
   The present value of the loan is **$11,931.45** + $1000 down payment
   You can look at cars that sell for **$12,931.45, about $13,000**
   Fill in the chart below, changing the chart depending on the variables. Alpha solve for the ?

	a) 9.4% 5 yrs	b) 7% 5 yrs	c) 7% 4 yrs	d) You choose
N =	60	60	48	
Interest % =	9.4	7	7	
PV =	**$11,931**	**$12,625**	$12,626	
PMT =	–250	–250	? = 302.35	
FV = 0	0	0	0	
P/Y =	12	12	12	
C/Y =	12	12	12	
Value of car: PV + $1000	**$12,931**	**$13,625**	**$13,626**	
Total $ Output (add $1000)	$15,000 +1,000	$15,000 +1,000	$14,512 +1,000	
Interest $	$3,069	$2,375	$1,887	

Continued...

ALPHA SOLVE for N

2. Suppose you win a million dollars in the lottery — straight cash. The government takes 30%. You want to spend $150,000 up front and bank the rest. If the interest rate on a solid investment is 8% compounded quarterly, how long until you become a millionaire again?
   Note: P/Y and N are in the same units, i.e. months, days, quarters, or years.
   For present value (PV) enter what is left after the IRS: **100000000 • .7 – 150,000 = 550,000.** It needs to be a negative value.
   While the cursor is flashing on the value of N, enter ALPHA SOLVE.

   Look at the difference between these.

	Quarterly	Monthly	Daily
N =	**30.18978**	**89.97**	**2727.93**
Interest % =	8	8	8
PV =	–550,000	–550,000	–550,000
PMT =	0	0	0
FV = 1	100,000,000	100,000,000	100,000,000
P/Y =	4	12	365
C/Y =	4	12	365
N in years	*7.55* years	*7.5* years	*7.5* years

Alpha Solve for Future Value (FV)

3. Suppose when you were born, a relative put in $10/week (–10 PMT) until you were 21.
   At an average annual interest rate of 6.5%, how much will you have on your 21st birthday?
   $22,716

	$10 at 6.5%	$20 at 6.5%	$10 at 8%	$20 at 8% monthly
N =	21 • 52			
Interest % =				
PV =	0			
PMT =	–10			
FV at 21st				
P/Y =	52			
C/Y =	1			12

   Notice that the payments/ year (P/Y) are ____,

   but the compound periods/ year(C/Y) is ___ since we assumed annual interest compounding.

Alpha Solve for Interest (I%)

4 Suppose you find an old passbook in the vault after your great, great, great somebody died. There was one deposit for $1,000 in March 1959. When you brought the passbook to the bank, they ran it through the computer and the new balance in March 2005 was $9,789.
What was the average annual interest rate for all those years?

	#4	#5
N =	46	72
Interest % =	5	14.3
PV =	–1000	7098
PMT =	9	–147.40
FV = 0	9789	0
P/Y =	1	12
C/Y =	1	12

Alpha Solve for Payment (PMT)

5. You find a great stereo system to buy. Of course you can't afford to pay with cash.
   The store offers to finance it for you for 6 years at a great rate of 14.3% (compounded monthly).
   The system sells for $7,098 with tax.

   a. What are the monthly payments? **$147.40**

   b. What is the total interest? **$3,514.80**

6. Suppose you have a VISA bill of $2000 at 21% and you can only afford to pay the minimum amount of $20.
   Find out how much you will owe at the end of the year and how much you have paid on it.

	One month	One year
N =	1	12
Interest % =	21	21
PV =	2000	2000
PMT =	–20	–20
FV = (Amount owed)	**–2015**	**–2198**
P/Y =	12	12
C/Y =	12	12
Total paid	$20	$240
Total Extra Above $2000 (Payments plus extras)	$35	$438

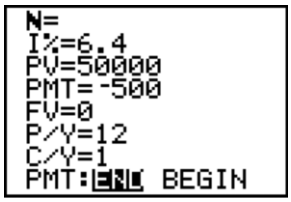
   How much is the usual penalty for a late payment?

Continued...

Press ALPHA SOLVE while the cursor is flashing on the N.

7. Suppose you inherit $50,000 and would like it to supplement your income for years to come. It is now in an account earning 6.4% annual interest. If you withdraw $500 per month, how long will the money last? $300?

	$500	$300
N =		
Interest % =		
PV =		
PMT =		
FV = 0		
P/Y =		
C/Y =		
Years?		



Real-life research

Find a car to buy and research what you could get for a loan Then, decide the following:

Real life Car Payment: _____ (Solve for this.)

N = _____

I % = _____

PV = _____

PMT = _____

FV = 0

P/Y = 12

C/Y = 12

Down payment: _____

Years: _____

Loan %: _____

Loan Source: _____

Car make: _____

Price: _____

Source: _____

What was the most valuable information you learned from this lesson?

Please write at least five complete sentences.

More

Add example that mimics retirement investing. Research and/or compare the following

1. Investing monthly paying a 5.25% fee – up front
2. Investing monthly paying a 1 – 2 % fee on the balance

Research

- Loans
- Credit cards
- Investments

More Ideas?

Send to Cindy Kuz at mckuz@yahoo.com

Resource

Suggested Reference text: *TI Explorations, Time , Value, Money: Applications on the TI 83* by Hoffman and Hoffman

Take a break from math!
Use the FINANCE App on the TI-83/84 calculator
to teach real-world applications.

—Joan Kessler

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