6. Blaine wants to have $1,000 in 10 years. The following are the choices in which he can invest:

- a savings account earning 3% compounded quarterly, 741.839 ← PV
- a checking account earning 1% compounded monthly, or 904.97 ← PV
- a money market account earning 4.5% compounded semiannually.

Blaine plans on making no withdrawals or deposits for 10 years. 640.61 ← PV

Rewrite the formula from Question 3 for present value and allow for any compounding period (n).

9. **REFLECTION**: In which account should Blaine invest? Why?

$$1{,}000 = PV\left(1 + \frac{.03}{4}\right)^{(4\cdot 10)}$$

$$\frac{1{,}000}{1.348} = \frac{PV(1.348)}{1.348}$$

$$741.69 = PV$$

MONEY MARKET

HE CAN INVEST THE LEAST AND STILL GET $1,000

6. Blaine wants to have $1,000 in 10 years. The following are the choices in which he can invest:

- a savings account earning 3% compounded quarterly, 741
- a checking account earning 1% compounded monthly, or 901
- a money market account earning 4.5% compounded semiannually. 640

Blaine plans on making no withdrawals or deposits for 10 years.

Rewrite the formula from Question 3 for present value and allow for any compounding period (*n*).

9. **REFLECTION:** In which account should Blaine invest? Why?

$1{,}000 = PV\left(1 + \frac{.045}{2}\right)^{(2 \cdot 10)}$

$\frac{1{,}000}{1.56} = \frac{PV(1.56)}{1.56}$

$= PV$

MONEY MARKET, BECAUSE YOU CAN PUT THE LEAST IN AND GET SAME $

Name_____ Date_____

Using the TVM function on the calculator

1) [Apps] and choose finance, and 1: TVM solver

Use the tables below (which are set up exactly like the calculator) to determine what it is you are looking for. Enter all the information into your calculator. In the area you are trying to find, hit [alpha] enter and this will 'solve' that missing category for you

James wants to find the future value of an investment of $1,000 over 5 years with an interest rate of 2.3% compounded monthly:

a) Solve this equation using the FV formula: $FV = 1000\left(1 + \frac{.023}{12}\right)^{(12 \cdot 5)} = 1121$

Variable	Definition of Variable	Value
N	Number of compounding periods between the time of investment and the time of retirement. **(n*t)** EXPONENT	12.5 60
I%	Annual interest rate (as a percent)	2.3
PV FOR SAVINGS	Principal, or present value (keep negative, because it is the money you have to put in)	−1000
PMT	Amount of each regular payment(per compounding period, like per month or per year)	0
FV	Future value, or value of the investment at maturity	X
P/Y	Number of payments per year (usually the same as the number of compounding periods per year ***C/Y)*** n	12
C/Y	Number of compounding periods per year n	12

How much money does Abby need to put down in principal to have 35,000 saved in 20 years at a 1.3% interest rate compounded quarterly?

a) Solve this equation using the FV formula:

P/Y	Number of payments per year (usually the same as the number of compounding periods per year ***C/Y)***	
C/Y	Number of compounding periods per year	

How much money does Abby need to put down in principal to have 35,000 saved in 20 years at a 1.3% interest rate compounded quarterly?

a) Solve this equation using the FV formula:

Variable	**Definition of Variable**	**Value**
N	Number of compounding periods between the time of investment and the time of retirement. **(n*t)**	4·20 80
I%	Annual interest rate (as a percent)	1.3
PV	Principal, or present value (keep negative, because it is the money you have to put in)	X O 26,998.19
PMT	Amount of each regular payment(per compounding period, like per month or per year)	0
FV	Future value, or value of the investment at maturity	35 000
P/Y	Number of payments per year (usually the same as the number of compounding periods per year ***C/Y)***	4
C/Y	Number of compounding periods per year	4

Jack wants to save up for a car. He has $1,000 now and needs $5,000. If he has an interest rate of 1.9% compounded monthly how long will it take him to get to $5000?

a) Solve this equation using the FV formula:

Variable	Definition of Variable	Value
N	Number of compounding periods between the time of investment and the time of retirement. **(n*t)**	x 0 = 1017 ÷ 12 = 95 years
I%	Annual interest rate (as a percent)	1.9
PV	Principal, or present value (keep negative, because it is the money you have to put in)	-1000
PMT	Amount of each regular payment(per compounding period, like per month or per year)	0
FV	Future value, or value of the investment at maturity	6000
P/Y	Number of payments per year (usually the same as the number of compounding periods per year ***C/Y)***	12
C/Y	Number of compounding periods per year	12

Let's try something more realistic. Saving interest rates are NOT at 2% they are closer to 0.05%. Try this situation which would be close to someone graduating from high school

Jane got a gift from her grandparents when she graduated high school of $1500. She is going to keep it in her savings account until she graduates college and then is going to use that money to help with buying a house. If she keeps it in her savings account for 4 years at a 0.05% interest rate calculated monthly. How much will she have when she graduates?

Variable	Definition of Variable	Value

Let's try something more realistic. Saving interest rates are NOT at 2% they are closer to 0.05%. Try this situation which would be close to someone graduating from high school

Jane got a gift from her grandparents when she graduated high school of $1500. She is going to keep it in her savings account until she graduates college and then is going to use that money to help with buying a house. If she keeps it in her savings account for 4 years at a 0.05% interest rate calculated monthly. How much will she have when she graduates?

Variable	Definition of Variable	Value
N	Number of compounding periods between the time of investment and the time of retirement. **(n*t)**	12.4 48
I%	Annual interest rate (as a percent)	.05
PV	Principal, or present value (keep negative, because it is the money you have to put in)	-1500
PMT	Amount of each regular payment (per compounding period, like per month or per year)	0
FV	Future value, or value of the investment at maturity	0X = 1503.00
P/Y	Number of payments per year (usually the same as the number of compounding periods per year ***C/Y)*** n	12
C/Y	Number of compounding periods per year n	12

Ok, so what if Jane puts money into her savings account each month. We will have to use the PMT option. She will put away $100 every month so put -100 in for PMT and recalculate how much she will have

Variable	Definition of Variable	Value
N	Number of compounding periods between the time of investment and the time of retirement. **(n*t)**	48
I%	Annual interest rate (as a percent)	.05
PV	Principal, or present value (keep negative, because it is the money you have to put in)	-1500
PMT	Amount of each regular payment (per compounding period, like per month or per year) NEGATIVE	-100
FV	Future value, or value of the investment at maturity	X0 6,307.71
P/Y	Number of payments per year (usually the same as the number of compounding periods per year ***C/Y)***	12
C/Y	Number of compounding periods per year	12

You can also use this App for Loans. Let's calculate out something all of you will need to start thinking about soon- student loans. Current in-state tuition for Kennesaw State University is about $5,818 a year. (this assumes you are living AT HOME). Assume you go to college for 4 years and to make calculation easier assume you live on campus all 4 years. Your parents have saved a TOTAL of $8,000 for your 4 years at college. 1) Figure out how big of a loan you will have to take out. 2) Calculate your MONTHLY payment on your student loans. Assume your loan rate is 6.8% over 10 years compounded monthly. (PV will be how much you need in a loan, FV is 0 because obviously in the future you want to OWE 0 dollars and *solve* for PMT. *(With Dorm it is $14,063 per year)*

Variable	Definition of Variable	Value

C/Y	Number of compounding periods per year	

LOANS

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PREVIEW

STANDARD FEDERAL LOAN

5,818 x 4 = 23,272 − 8,000 = 15,272

Variable	Definition of Variable	Value
N	Number of compounding periods between the time of investment and the time of retirement. **(n*t)**	12·10 120
I%	Annual interest rate (as a percent)	6.8
PV	Principal, or present value (**for loans it should be positive because it is money you are having to pay back)**	15,272
PMT	Amount of each regular payment (per compounding period, like per month or per year)	X = −$175.75
FV	Future value, or value of the investment at maturity	0
P/Y	Number of payments per year (usually the same as the number of compounding periods per year ***C/Y)***	12
C/Y	Number of compounding periods per year	12

LOANS PV IS POSITIVE

LOANS FV IS ALWAYS 0

LOANS

PROJECT

You can also use this App for Loans. Let's calculate out something all of you will need to start thinking about soon- student loans. Current in-state tuition for Kennesaw State University is about $5,818 a year. (this assumes you are living AT HOME). Assume you go to college for 4 years and to make calculation easier assume you live ~~on campus~~ AT HOME all 4 years. Your parents have saved a TOTAL of $8,000 for your 4 years at college. 1) Figure out how big of a loan you will have to take out. 2) Calculate your MONTHLY payment on your student loans. Assume your loan rate is 6.8% over 10 years compounded monthly. (PV will be how much you need in a loan, FV is 0 because obviously in the future you want to OWE 0 dollars and *solve* for PMT. *(With Dorm it is $14,063 per year)*

STANDARD FEDERAL LOAN RATE

5,818
x 4
23,272
-8,000
15,272

Variable	Definition of Variable	Value
N	Number of compounding periods between the time of investment and the time of retirement. **(n*t)** (12 - 10)	120
I%	Annual interest rate (as a percent)	6.8
PV	Principal, or present value (**for loans it should be positive because it is money you are having to pay back)**	15,272
PMT	Amount of each regular payment (per compounding period, like per month or per year)	x =$175.75
FV LOANS	Future value, or value of the investment at maturity	0
P/Y	Number of payments per year (usually the same as the number of compounding periods per year ***C/Y)***	12
C/Y	Number of compounding periods per year	12