Interests 1.11.17

Assessment return and talk about test corrections

Warm up: Explicit formulas from sequences

Hook: How many of you ever want to own a car?
Well cars are expensive and if you want a nice one, you can take out a loan.
Does anyone know how a loan works?
Explain how a loan works? And how banks make money on loans.
There are three types of interest we should be concerned about

Simple interest
$A = P(1 + rt)$
A=Final investment value
P=Principal
r=Rate percent turned into a number
t=time
Assume we buy a $5,000 car. And the average interest rate for a teenager is 6.5% for 6 years
Turn the % into a decimal 6.5% turns into .065
So we can create the equation $A = 5000(1 + (.65)6)$ which equals $6950 when you pay it off

Then there is Compound interest
$A = P(1 + \frac{r}{n})^{nt}$
A=Final investment value
P=Principal
r=Rate percent turned into a number
t=time
n=number of times interest in compounded per year
Assume we add a different $5,000 dollar car to our collection. Using the same interest and the same time and lets compound monthly. I am sure you have heard monthly in one of those fucillo commercials. Most loans are compounded monthly. Use 12 as the number of times compounded per year.
Do you think this in the long run will be more or less than the simple interest?
$A = 5000(1 + \frac{.065}{12})^{12(6)}$
So we have to simplify what is in the parenthesis first then take it to the power and then multiply it by 5000 to get; $7377.14

Then there is continuous compounding interest

$A = P e^{rt}$

A, P, r and t are all the same. But e is a mathematical constant at 2.718281828…..
So we should add to our collection of $5000 dollar cars.
We can use the equation, where do you think it will fall compared to the other two equations?

$A = 5000 e^{.065(6)}$ to get A=$7384.90.

You try all three equations for $1,000 over ten years at a rate of 5%. If it is compound interest it is compound 12 times a year.

HW. Research a car any car you want. Use a rate of 7% and calculate all 3 interests for a 5 year loan. If it is compounded it is compounded monthly.