NGPF COHORT 21 PROJECT

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During the first cohort of the NGPF certification classes, I participated in two courses - Psychology of Money and Investing. This project will focus primarily on the Investing course, which I found useful and easily applicable to

The Importance of Compounding. Research shows that our students will likely not be able to depend on traditional retirement options such as pension programs. Therefore, it is important to emphasize the need for both saving and investing. Compouding interest is a powerful concept that students can hold on to. Compounding interest relies on the exponential function and the formula can be proven in an algebra or precalculus course. The mathematics behind the formula is interesting, particularly in the context of limits in precalculus, and can be used to motivate and derive the natural exponential function. But in addition to the nice theory, this is a good place to emphasize a very practical application to students that they can use for the rest of their lives.

Below is a lesson plan for a 50-minute math class at the honors precalculus level on the topic of compound interest.

Some notes for the teacher:

(1) The main compound interest formula can be motivated by way of example using a bank and a fixed principal, interest rate, compound time and number of compounding intervals.

(2) The natural exponential function e^x can be motivated ocne limits have been covered.

(3) The "Rule of 72" (which gives a quick shortcut to calculate how long it takes to double an investment) can be proven more precisely using the change of base formula.

Name:_____

Compound Interest Problems

Recall the formula $A = P\left(1+\frac{r}{n}\right)^{nt}$

1. How much will \$5000 be worth in 8 years if it is invested in an account paying 4% interest, compounded monthly?

2. If \$30,000 is put in a bank giving 3.5% interest compounded semiannually, how long will it take for the account to be worth \$32,000 ?

3. If you have \$8000 to invest and want it to grow to \$9500 in 2 years, what interest rate do you need if it is to be compounded quarterly?

4. How much will the \$5000 be worth in 8 years if the 4% interest is compounded continuously?

5. How long will it take money to double in an account paying 4% interest, compounded monthly?

6. How long will it take to double if the 4% interest is compounded continuously?

7. How long will it take money to quadruple if it's in an account paying 7% interest, compounded continuously?

8. Bank A offers a savings account with 4% interest compounded monthly. Bank B offers an account with 3.95% interest compounded daily. Which is the better deal?

9. Find the effective rates of interest to determine the better deal: 2% compounded quarterly or 1.999% compounded continuously.

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