

Alg2 Classwork/Homework, due Monday, February 12

On a separate sheet of paper, answer each question, showing as much of your work as possible.

The following formulae for compound and continuous interest might be useful in answering your questions.

$$A_t = P \cdot \left(1 + \frac{r}{n}\right)^{n \cdot t} \quad \text{and} \quad A_t = P \cdot e^{r \cdot t}$$

Suppose you bought a 10-year T-note in the amount of \$500 on 15 August 2009 at an annual interest rate of 4.5% per year.

First, using compound interest, where n is once-per-hour

- What amount of interest did you earn in the first year?
- What amount of interest will you earn in the last year?
- How much interest will you have earned when the note matures on 15 August 2019?
- Make a list of the total value (amount plus interest) for each of the ten years. What kind of sequence is it? How do you know? (You might want to make a graph.)
- What will the value of the T-note be at maturity?
- What will the value of the T-note be if it did not mature until 15 August 2059? (fifty years)

Second, using continuously compounded interest

- What amount of interest did you earn in the first year?
- What amount of interest will you earn in the last year?
- How much interest will you have earned when the note matures on 15 August 2019?
- Make a list of the total value (amount plus interest) for each of the ten years. What kind of sequence is it? How do you know? (You might want to make a graph.)
- What will the value of the T-note be at maturity?
- What will the value of the T-note be if it did not mature until 15 August 2059? (fifty years)
- How long would it take for a T-note like this to be worth \$5000?
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