

## Compound Interest Mini-Project Form A Algebra II PreAP

### Goal:

The goal is to use compound interest formulas to investigate and compare savings situations while using your writing skills to clearly communicate the solution.

### Role:

You are the financial consultant for a young couple who are in need of financial advice.

### Situation:

In this recession, everyone is looking to earn the most they can on their savings. You have been hired as a financial consultant to help people determine the best options for their savings plans. Utilizing your compound interest skills, you need to convince the young couple of the best option for their savings.

### Scenario:

Joe and Josephina Nestegg wish to invest in a no-risk savings account. They currently have \$25,000 in an account bearing  $5\frac{1}{4}\%$  annual interest, compounded continuously. The following options are available to them:

- i. keep the money in the account they currently have
  - ii. invest the money in an account bearing  $5\frac{7}{8}\%$  annual interest, compounded annually
  - iii. invest the money in an account bearing  $5\frac{1}{2}\%$  annual interest, compounded quarterly
- a. Determine the equation for the value for the investment as a function of time for each of the three options. (Calculations)
- b. Graph all three functions on the same coordinate plane so each graph is distinguishable. Be sure to label all information and points. Include tables of expected amounts for 6 years. (Graphs/tables)
- c. The couple is hoping to have \$35,000 saved for a down payment on a house within six years. Write a brief summary to the couple that describes the implications of these options. (Letter)
- d. The *effective interest rate* (also known as *effective yield*) is a better way to determine the true value an investment method. The effective interest rate includes the interest that is added into an account due to multiple compounding periods in a year to find a more accurate representation of how fast an account will grow. Find the effective interest rate for the three options listed above using the formulas:
- $$\text{Compound Effective Interest Rate} = \left(1 + \frac{r}{n}\right)^m - 1 \quad \text{and} \quad \text{Continuous Effective Interest Rate} = e^{rt} - 1$$
- How can the effective yield be used to decide which option is best? How does the effective interest rate compare to the nominal (given) interest rate for each savings account?
- e. Your project should include but not limited to the following:
1. a letter of proposal referencing each option (22 pts)
  2. calculations for each situation (30 pts)
  3. graphs and tables of the three situation (48 pts)

**Must be typed or neatly hand written (except calculations and graphs). This project is due May 15, 2017. If it is late, your pay (grade) as a consultant will be docked. Worth 2 minor grades.**