

STUDENT LOAN PROJECT



Words to know:

Principal: The dollar amount of a loan that's initially borrowed. It's also the amount on which interest is charged. For example, if you borrow a \$10,000 loan (assuming you're charged no fees), your principal amount will be \$10,000.

Interest: The fee charged by a bank or lender to borrow money, charged as a percentage of the principal borrowed.

Equations to use:

Formulas for Compound Interest

After t years, the balance A in an account with principal P and annual interest rate r (in decimal form) is given by the following formulas.

1. For n compoundings per year: $A = P \left(1 + \frac{r}{n} \right)^{nt}$

2. For continuous compounding: $A = Pe^{rt}$

n = number of times compounded per year.

t = time in years

Part 1: Gathering Information

1. What college/university are you going to research? _____
2. What is the tuition of that college/university? _____

Part 2: Scenario 1

You just received your financial aid package in the mail and discovered that you will receive a 50% scholarship! Congrats! This means that you still owe _____, so you take out a Federal Student Loan (not private loan) for that much.

Things to Note:

- You are charged a 1.073% loan fee
- The interest rate for this loan is 4.29%
- The interest rate for this loan is compounded monthly
- Typically, you won't have to start repaying your student loan until 6 months after graduation

1. Including the loan fee, the principal amount of your loan will be: _____
2. How much will you owe after 5 years? _____
3. How much will you owe after 10 years? _____
4. How long will it take you to pay the loan off if you make monthly payments of \$250? _____

(Hint: Graph two functions, one linear and one exponential. Look at the intersection point.)

Part 3: Scenario 2

You just received your financial aid package in the mail and discovered that you will receive a 0% scholarship, bummer. This means that you still owe _____, so you take out a Federal Student Loan (not private loan) for that much.

Things to Note:

- You are charged a 1.073% loan fee
- The interest rate for this loan is 4.29%
- The interest rate for this loan is compounded monthly
- Typically, you won't have to start repaying your student loan until 6 months after graduation

1. Including the loan fee, the principal amount of your loan will be: _____
2. How much will you owe after 5 years? _____
3. How much will you owe after 10 years? _____
4. How long will it take you to pay the loan off if you make monthly payments of \$300? _____

(Hint: Graph two functions, one linear and one exponential. Look at the intersection point.)

Part 4: Scenario 3

You decide that you need to do something extra to be able to afford college. Therefore, before you leave for college, you invest \$500 in an account at an annual interest rate of 3%. Find the balance in this account when you graduate after 4 years for each type of compounding:

- Quarterly
- Continuous