You will need:
- Student Notes
- Calculator
- Textbook
- 3-2 Notes
- Notebook Paper
- Pen or Pencil

**OBJECTIVES**

**Explain** the options available for student loans.

**Calculate** the interest paid in various student loan situations.
No Ear Buds!!!!

Cell Phones: Down & Dark
How Can You Pay for College?

• Savings
• Scholarships
• Dual Credit classes in high school
• Student loans

Today we will learn about student loans.
Definitions

Subsidized Student Loan: A loan where the government pays your interest during the grace period.

Grace Period: The time period that you are in school plus 6 months after you graduate.

Capitalized Interest: Unpaid interest that is added to the principal.
Ariana got a $9,100 subsidized student loan for her first semester at college at 4.29% for 10-years. How much interest will she pay while she is in school and during the grace period?

$0
**Subsidized Student Loan:**

**Grace Period:**
The government pays the interest

**Repayment Period:**
Follow the 3-2 Steps
Principal: original loan amount
Rate = given
Time = 10 years
Ariana got a $9,100 **subsidized** student loan for her first semester at college at 4.29% for 10-years. How much interest will she pay in total? Follow the steps on 3-2 Notes.

a) Find the monthly payment

Remember:

**Monthly Payment Formula:**  

\[ M = \frac{P \left( \frac{r}{12} \right) \left( 1 + \frac{r}{12} \right)^{12t}}{\left( 1 + \frac{r}{12} \right)^{12t} - 1} \]

- **M** = monthly payment __M__
- **P** = Principal **9,100**
- **r** = annual interest rate (converted) **0.0429**
- **t** = length of loan in years **10**
Ariana got a $9,100 **subsidized** student loan for her first semester at college at 4.29% for 10-years.

a) Find the monthly payment

\[
M = \frac{9,100 \left( \frac{.0429}{12} \right) \left( 1 + \frac{.0429}{12} \right)^{12 \cdot 10}}{\left( 1 + \frac{.0429}{12} \right)^{12 \cdot 10} - 1}
\]

Remember:

**Monthly Payment Formula:**

\[
M = \text{monthly payment } \_M\_
\]

\[
P = \text{Principal } \_9,100\_
\]

\[
r = \text{annual interest rate (converted)} .0429
\]

\[
t = \text{length of loan in years } \_10\_
\]

$93.39$
Example 1

Ariana got a $9,100 subsidized student loan for her first semester at college at 4.29% for 10-years.

b) Find the total monthly payments

\[
\text{total monthly payments} = \frac{\text{monthly payment} \times \text{# of years} \times 12}{\text{monthly payment} \times 10 \times 12} = \$11,206.80
\]
Ariana got a $9,100 **subsidized** student loan for her first semester at college at 4.29% for 10-years.

c) Find the total interest

\[
\text{total interest} = \text{total monthly payments} - \text{original principal} \\
= 11,206.80 - 9,100 \\
= $2,106.80
\]
Suppose that Ariana received an **Unsubsidized** Student Loan with a grace period for the same terms as example 1.

She knows that she will begin making loan payments after the grace period but interest will accrue from the moment the funds are credited to her account and will be capitalized into her loan.

How much will she have paid in interest?
Unsubsidized Student Loan:

Grace Period:
The unpaid interest is calculated using \( I = PRT \)
principal = original loan amount
rate = given
time = years in school + .5

Repayment Period:
Follow the 3-2 Steps
Principal: Original principal + unpaid grace period interest
Rate = given
Time = 10 years
Suppose that Ariana received an Unsubsidized Student Loan with a grace period for the same terms as example 1. She knows that she will begin making loan payments after the grace period but interest will accrue from the moment the funds are credited to her account and will be capitalized into her loan. How much will she have paid in interest?

Step 1: Interest during Grace Period

Remember:

**Simple Interest formula**

\[ I = PRT \]

- \( I \) = Interest
- \( P \) = Principal (beginning amount)
- \( R \) = Rate (converted)
- \( T \) = Time

\[ I = 9,100 \times 0.0429 \times 4.5 \]

\[ I = \$1,756.76 \]
Suppose that Ariana received an Unsubsidized Student Loan with a grace period for the same terms as example 1. She knows that she will begin making loan payments after the grace period but interest will accrue from the moment the funds are credited to her account and will be capitalized into her loan. How much will she have paid in interest?

Step 2: Find new Principal balance

New Principal Balance =

Original Principal + Grace Period Interest

= 9,100 + 1,756.76

= $10,856.76
Example 2

How much interest will she pay in total?
Follow the steps on 3-2 Notes.
a) Find the monthly payment

\[
M = \frac{P \left( \frac{r}{12} \right) \left( 1 + \frac{r}{12} \right)^{12t}}{\left( 1 + \frac{r}{12} \right)^{12t} - 1}
\]

Remember:
**Monthly Payment Formula**

\[
M = \text{monthly payment } \underline{M}
\]

\[
P = \text{Principal } \underline{10,856.76}
\]

\[
r = \text{annual interest rate (converted) } .0429
\]

\[
t = \text{length of loan in years } \underline{10}
\]
How much interest will she pay in total? Follow the steps on 3-2 Notes.

a) Find the monthly payment

\[
M = \frac{10856.76 \left( \frac{.0429}{12} \right) \left( 1 + \frac{.0429}{12} \right)^{12 \cdot 10}}{\left( 1 + \frac{.0429}{12} \right)^{12 \cdot 10} - 1}
\]

Remember:

**Monthly Payment Formula**

\[
M = \text{monthly payment } M_{\text{10,856.76}}
\]

\[
P = \text{Principal } 10,856.76
\]

\[
r = \text{annual interest rate (converted) } .0429
\]

\[
t = \text{length of loan in years } 10
\]

$111.42

Slide 16
How much interest will she pay in total? Follow the steps on 3-2 Notes.

b. Find the total monthly payments

\[
\text{total monthly payments} = \text{monthly payment} \times \text{# of years} \times 12
\]
\[
= 111.42 \times 10 \times 12
\]
\[
= $13,370.40
\]
How much interest will she pay in total? Follow the steps on 3-2 Notes.

c. Find the total interest

\[
\text{total interest} = \text{total monthly payments} - \text{original principal}
\]

\[
= 13,370.40 - 9,100
\]

\[
= \$4,270.40
\]
Suppose that Ariana received an Unsubsidized **Regular** Student Loan with a grace period for the principal only for the same terms as example 1. She will have to pay interest every month during the grace period then begin regular payments after the grace period.

a) What would have been her monthly interest payment on April 1st?

(March has 31 days)
Regular Student Loan:

Grace Period:
The student pays interest only each month using
\[ I = PRT \]
Principal = original loan amount
Rate = given
Time = # of days in the PRIOR month/365

Repayment Period:
Follow the 3-2 Steps
Principal: Original principal
Rate = given
Time = 10 years

Total Interest paid over the entire term of the loan =
Total interest during grace period + interest paid during the repayment period
Suppose that Ariana received an Unsubsidized Regular Student Loan with a grace period for the principal only for the same terms as example 1. She will have to pay interest every month during the grace period then begin regular payments after the grace period.

a) What would have been her monthly interest payment on April 1st?

(March has 31 days)

**Simple Interest formula**

\[ I = \text{Interest} = \frac{I}{P} \]

\[ P = \text{Principal (beginning amount)} = 9,100 \]

\[ R = \text{Rate (converted)} = 0.0429 \]

\[ T = \text{Time} = \frac{31}{365} \text{ days} \]

\[ I = PRT \]

\[ I = 9,100 \times 0.0429 \times \left(\frac{31}{365}\right) \]

\[ I = \$33.16 \]
Suppose that Ariana received an Unsubsidized Regular Student Loan with a grace period for the principal only for the same terms as example 1. She will have to pay interest every month during the grace period then begin regular payments after the grace period.
b) How much interest would she pay in total?
How much interest will she pay in total?

Example 3b

Repayment Period:
Follow the 3-2 Steps
Principal: Original principal
Rate = given
Time = 10 years

3-2 Steps:

a) Find the monthly payment

\[ M = \frac{P \left( \frac{r}{12} \right) \left( 1 + \frac{r}{12} \right)^{12t}}{\left( 1 + \frac{r}{12} \right)^{12t} - 1} \]

M = monthly payment _____

P = Principal _____9,100_____

r = annual interest rate rate (converted) _____0.0429_____

t = length of loan in years _____10_____
How much interest will she pay in total?
Follow the steps on 3-2 Notes.

a) Find the monthly payment

\[ M = \frac{9,100 \left( \frac{.0429}{12} \right) \left( 1 + \frac{.0429}{12} \right)^{12 \cdot 10}} {\left( 1 + \frac{.0429}{12} \right)^{12 \cdot 10} - 1} \]

Remember:
**Monthly Payment Formula**

\[ M = \text{monthly payment } \_\_\_\_\_\_\_\_\_ \]

\[ P = \text{Principal } \_\_\_\_\_\_\_\_\_ \]

\[ r = \text{annual interest rate rate (converted) } \_\_\_\_\_\_\_\_\_ \]

\[ t = \text{length of loan in years } \_\_\_\_\_\_\_\_\_ \]

\[ \text{Monthly Payment Formula} \]

\[ M = \text{monthly payment } \_\_\_\_\_\_\_\_\_ \]

\[ P = \text{Principal } \_\_\_\_\_\_\_\_\_ \]

\[ r = \text{annual interest rate rate (converted) } \_\_\_\_\_\_\_\_\_ \]

\[ t = \text{length of loan in years } \_\_\_\_\_\_\_\_\_ \]

\[ \text{Monthly Payment Formula} \]

\[ M = \text{monthly payment } \_\_\_\_\_\_\_\_\_ \]

\[ P = \text{Principal } \_\_\_\_\_\_\_\_\_ \]

\[ r = \text{annual interest rate rate (converted) } \_\_\_\_\_\_\_\_\_ \]

\[ t = \text{length of loan in years } \_\_\_\_\_\_\_\_\_ \]

\[ \text{Monthly Payment Formula} \]

\[ M = \text{monthly payment } \_\_\_\_\_\_\_\_\_ \]

\[ P = \text{Principal } \_\_\_\_\_\_\_\_\_ \]

\[ r = \text{annual interest rate rate (converted) } \_\_\_\_\_\_\_\_\_ \]

\[ t = \text{length of loan in years } \_\_\_\_\_\_\_\_\_ \]

\[ \text{Monthly Payment Formula} \]

\[ M = \text{monthly payment } \_\_\_\_\_\_\_\_\_ \]

\[ P = \text{Principal } \_\_\_\_\_\_\_\_\_ \]

\[ r = \text{annual interest rate rate (converted) } \_\_\_\_\_\_\_\_\_ \]

\[ t = \text{length of loan in years } \_\_\_\_\_\_\_\_\_ \]

\[ \text{Monthly Payment Formula} \]

\[ M = \text{monthly payment } \_\_\_\_\_\_\_\_\_ \]

\[ P = \text{Principal } \_\_\_\_\_\_\_\_\_ \]

\[ r = \text{annual interest rate rate (converted) } \_\_\_\_\_\_\_\_\_ \]

\[ t = \text{length of loan in years } \_\_\_\_\_\_\_\_\_ \]

\[ \text{Monthly Payment Formula} \]

\[ M = \text{monthly payment } \_\_\_\_\_\_\_\_\_ \]

\[ P = \text{Principal } \_\_\_\_\_\_\_\_\_ \]

\[ r = \text{annual interest rate rate (converted) } \_\_\_\_\_\_\_\_\_ \]

\[ t = \text{length of loan in years } \_\_\_\_\_\_\_\_\_ \]

\[ \text{Monthly Payment Formula} \]
How much interest will she pay in total? Follow the steps on 3-2 Notes.

b. Find the total monthly payments

\[ \text{total monthly payments} = \text{monthly payment} \times \# \text{ of years} \times 12 \]

\[ = 93.39 \times 10 \times 12 \]

\[ = $11,206.80 \]
How much interest will she pay in total?
Follow the steps on 3-2 Notes.

c. Find the total interest

\[
\text{total interest} = \text{total monthly payments} - \text{original principal}
\]
\[= 11,206.80 - 9,100\]
\[= $2,106.80\]

Is this your final answer?

**NO!** This is just the interest during the repayment period!
Regular Student Loan:

Grace Period:
The student pays interest only each month using
\[ I = PRT \]
principal =
original loan amount
rate = given
time = # of days in the PRIOR month

Repayment Period:
Follow the 3-2 Steps
Principal: Original principal
Rate = given
Time = 10 years

Total Interest paid over the entire term of the loan =
Total interest during grace period + interest paid during the repayment period
Grace Period:
The student pays interest only each month using

\[ I = PRT \]

principal = 
original loan amount
rate = given

time = # of days
in the PRIOR month

Find the interest paid during the grace period:

\[ I = 9,100 \times 0.0429 \times 4.5 \]

\[ I = \$1,756.76 \]

Remember:

**Simple Interest formula**

\[ I = \text{Interest} \]
\[ P = \text{Principal (beginning amount)} \]
\[ R = \text{Rate (converted)} \]
\[ T = \text{Time} \]
Regular Student Loan:

Receive Loan: $1,756.76
In school
Graduate: $2,106.80
End of Grace 6 mo
10 years
End of Loan

Grace
Grace Period:
The student pays interest only each month using:
I = PRT
principal = original loan amount
rate = given
time = # of days in the PRIOR month

Repayment
Repayment Period:
Follow the 3-2 Steps
Principal: Original principal
Rate = given
Time = 10 years

Total Interest paid over the entire term of the loan =
Total interest during grace period + interest paid during the repayment period
How much interest will she pay in total?

Find the total interest for the entire loan:

**Total Interest paid over the entire term of the loan =**

Total interest during grace period

+ Interest paid during the repayment period

$2,106.80

+ $1,756.76

$3,863.56

This is your final answer!
Please work on you assignment. It is due at the end of next class.

<table>
<thead>
<tr>
<th>Grade goes here</th>
<th>Read Pg: 164 to 170</th>
<th>Do Pg 171: #2-13</th>
<th>Last First P__ A:3-3</th>
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