**2.1 Analyzing Loans**

**By the end of the lesson you will be able to:**

1. Define *collateral* and *amortization tables*
2. Solve problems that involve single payment loans and regular payment loans 🡪 Taking what you know from investments and applying them to loans
3. Analyze loan options

**Collateral** is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_ that is held as security against the repayment of a loan.



An **amortization table** lists regular payments on a loan and shows how much of the payment goes toward the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and how much goes toward the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Example 1**

Lars borrowed $12,000 from the bank at 4.5% compounded monthly, to buy a car. The bank will use the car as **collateral** for the loan. Lars negotiated a regular loan payment of $350 at the end of each month in until the loan is paid off. Lars set up an **amortization table** to follow the progress of the loan.



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Payment Period** | **Payment ($)** | **Interest Paid ($)****Balance x** $\frac{rate}{compoundings per year}(\frac{r}{n})$ | **Principal Paid** | **Balance** |
| 0 |  |  |  | 12,000 |
| 1 | 350 |  |  |  |
| 2 | 350 |  |  |  |

1. How long will it take Lars to pay off his loan?

**We could continue to work out the amortization table or we can also use the financial app on the graphing calculator to solve this!**

N= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I% = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PV = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PMT = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

FV = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

P/Y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C/Y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



1. How much interest will Lars have paid by the time he has paid off the loan?

**Again, we can use our graphing calculator to solve for this!**

APPS

1:Finance 🡪 Press 1 or ENTER

Scroll down to A:$ Σ Int$ 🡪 Press ALPHA MATH (for A) or ENTER

$Σ Int$ **(1, # payments)**

**Example 2**

Matt is going to borrow $14,000 at 6% interest so that he can buy a car. He has gone to three banks, and they offer these terms:

* Bank A: Simple interest, a 3-year term, with one end-of-month payment
* Bank B: Interest compounded monthly, with regular monthly payments of $400
* Bank C: Interest compounded annually, single payment at the end of 5 years

Compare Matt’s options to find out which loan will have the least interest ?

**Bank A**

**Bank B**

N= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I% = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PV = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PMT = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

FV = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

P/Y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C/Y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Bank C**

**Example 3**

Bill has been offered the following two loan options for borrowing, $8500. What advice would you give him?

Option A: He can borrow at 4.06% interest, compounded annually, and pay of the loan in payments of $1800 at the end of each year.

Option B: He can borrow at 4.06% interest, compounded weekly, and pay off the loan in payments of $34.50 at the end of each week.

N= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I% = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PV = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PMT = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

FV = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

P/Y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C/Y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

N= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I% = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PV = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PMT = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

FV = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

P/Y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C/Y = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

