**Activity 5.7.4 Mortgage Payments**

Remember Gerry from Activity 3? He saved $20,000 for a down payment on a house with a selling price of $250,000. He needs to take out a $230,000 mortgage to buy the house. His bank is offering a 30 year mortgage with a 3.6% APR and a $1045.68 monthly payment. Interest is compounded and payments are made at the end of each month. When Gerry makes a payment, the bank first pays off the interest earned that month and then applies whatever is left over to the principal of the loan. The principal is just the amount that you still have to pay on the loan.

Before you start thinking about how the bank calculated that monthly payment, make sure you understand the concept of this repayment process. Look at the following table. This table is called an amortization schedule. It is a fancy name to describe a table that shows the repayment schedule of a loan over a fixed period time with a fixed payment schedule. This table should have 360 rows because Gerry will make a payment every month for 30 years! You only need to fill out a few rows of the table to get an idea of how this works.

This series of questions will help you fill in the values for the first month.

1. What is the balance remaining on the mortgage for the first month? (Hint: Has Gerry made any payments yet?)
2. What is the monthly interest rate?
3. How much interest is earned during the first month?
4. Gerry makes a payment of $1045.68 at the end of the first month. The interest charged must be paid off completely. How much money is left to apply to the balance of the mortgage?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Amount of Payment Applied to**Interest** | Amount of Payment Applied to**Principal** | Balance Remaining to Pay on the Mortgage (Principal) |
| Month 1 |  |  |  |
| Month 2 |  |  |  |
| Month 3 |  |  |  |
| Month 4 |  |  |  |
| Month 5 |  |  |  |

**Observations**

1. What do you notice about the values in the interest column as the number of months increases? Does this make sense? Explain.
2. What do you notice about the values in the amount of payment applied to principal column as the number of months increases? Describe why this is happening.
3. Gerry paid $1045.68 per month for 30 years. How much did he end up paying for his mortgage?
4. What was the actual price of the house when you consider the amount he paid on his mortgage and the down payment?

**Explanation of Numbers in Table**

First, let’s start with the monthly interest rate. Just like the previous work with compound interest, the APR has to be divided up into 12 months. Each month, 3.6% ÷ 12 or 0.3% interest is earned.

Now, find the interest earned on the remaining balance of the loan during the month. For that first month, no payments have been made yet so that balance of the loan is $230,000. The interest charged is 0.3% of $230,000 which is $690. Gerry’s monthly payment of $1045.68 must pay off the interest completely.

Any of the remaining monthly payment then gets applied to the principal. His monthly payment is always $1045.68. If you subtract the amount paid to interest, you will find the amount applied to the principal. For the first month, that is $1045.68 - $690 or $355.68 applied to the principal.

Even though Gerry paid over $1000 towards his mortgage, the amount of the mortgage only decreases by $355.68 the first month! He still has $230,000 - $355.68 or $229,644.32 to pay on his loan!