Lesson 3B: Mortgages

Looking at the **Amortization Period of Mortgage Loan** Table

You will always owe more to the bank than the initial amount you borrowed. This is because there is a cost to borrow the money (called interest).

The INTEREST RATE and the LENGTH OF THE MORTGAGE will both affect your **actual** total cost of your home.

- What happens to the dollar amounts inside the table as the interest rate increases?

_____

- What happens to the dollar amounts inside the table as the length of time increases?

_____

The dollar values **inside the table** represent:

the amount you pay <u>per month for every $1000</u> you borrow.

This repays the amount you borrow, as well as, the interest you owe.

Amortization Period of Mortgage Loan When Paid Monthly
(Blended payment of principal and interest per $1000 of loan)

Interest Rate	5 years	10 years	15 years	20 years	25 years
4.00%	$18.40	$10.11	$7.38	$6.04	$5.26
4.25%	18.51	10.23	7.50	6.17	5.40
4.50%	18.62	10.34	7.63	6.30	5.53
4.75%	18.74	10.46	7.75	6.44	5.67
5.00%	18.85	10.58	7.88	6.57	5.82
5.25%	18.96	10.70	8.01	6.71	5.96
5.50%	19.07	10.82	8.14	6.84	6.10

FINDING MONTHLY MORTGAGE AND TOTAL MORTGAGE COSTS

EXAMPLE 1:

If you were to mortgage/borrow exactly $1000 at 4% over 25 years, then...

- Using the table, locate 4% and 25 years. What dollar amount do you find?

  $5.26/month

- This is the amount you owe every month for 25 years. What is the total amount you will have paid at the end of the 25 years?

  $5.26/month x 12 months x 25 years = $1578

  In the end, the **actual** total you pay would be $1578.

- What does this mean?

  At the end of the 25 years, you will have paid back the $1000 plus $578 interest.

  (In other words, the cost of borrowing $1000 is $578.)

EXAMPLE 2:

In the case of a mortgage, the loan amount is usually in the hundreds of thousands of dollars. So using the numbers above, if you borrowed $200 000 (instead of just $1 000) you would owe 200 times as much!

  $200 000 is 200 thousands.

  $5.26/month x 200 = $1052/month

Over the total time, the total cost of the mortgage would be:

  $1052/month x 12 months x 25 years = $315 600.

  At the end of the 25 years, the **actual** total you pay would be $315 600.

  (In other words, the cost of borrowing $200 000 is $115 600!)

Would you rather pay $18.40/month for 5 years or $5.26/month for 25 years?

Practice Question:

You take out a mortgage of $75,000.00 from the credit union for 25 years at a rate of 4.75%.

   a) Find the monthly payment.
   b) Find the total amount you pay at the end of the 25 years.

WHAT DOES OUR MONTHLY MORTGAGE PAYMENT TELL US?

After we find the monthly mortgage payment, we will be able to find out how much we pay for interest and principal. We will also be able to find the unpaid balance and the owner's equity.

Owner's Equity

Interest Portion ← Monthly Mortgage Payment → Prinicpal Portion

Unpaid Loan Balance
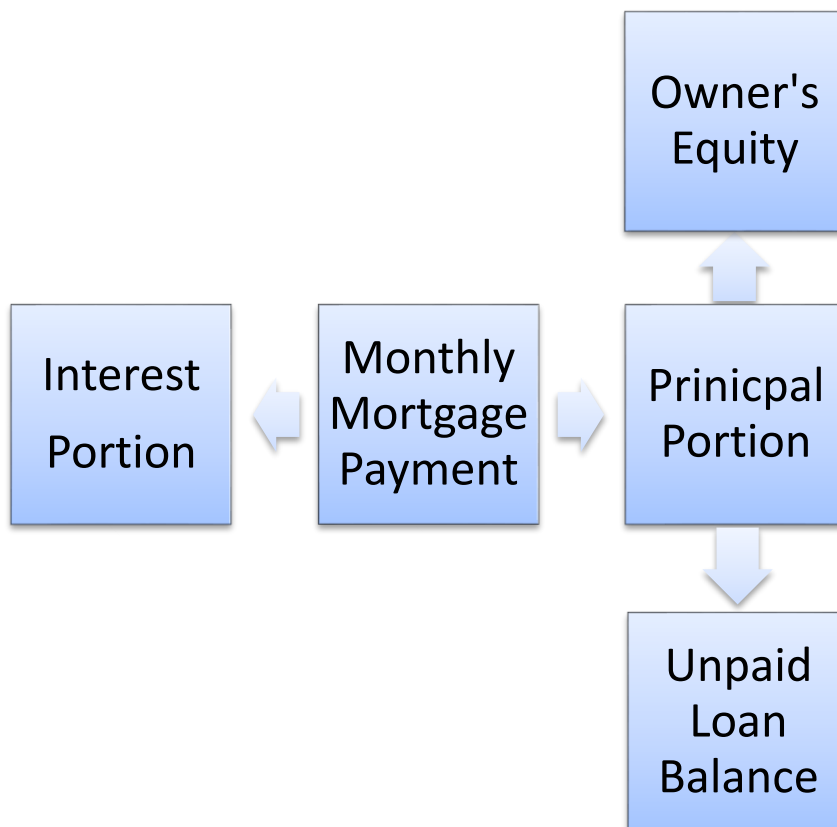
FINDING PRINCIPAL PORTION AND INTEREST PORTION

EXAMPLE 3:

The total mortgage payment per month is $361.80. The interest portion is $200.00. Find the portion paid toward the principal.

Solution

Monthly mortgage payment = interest portion + principal portion
$361.80 - $200.00 = $161.80 goes toward paying down the mortgage loan.
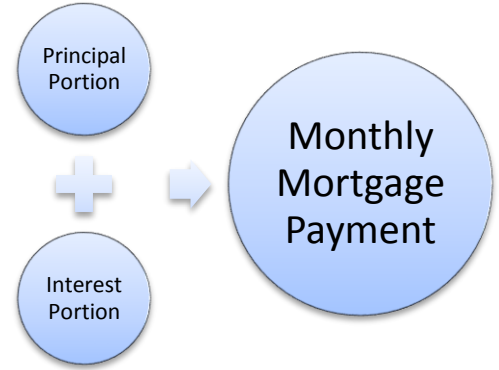
Suppose instead, we knew the mortgage payment was $512.65 and the principal portion was $112.65. How would we determine the interest portion?

Principal Portion

Interest Portion

Monthly Mortgage Payment

CALCULATING INTEREST PORTION

EXAMPLE 4:

You owe $45 000 on your mortgage loan. Your monthly mortgage payment is $379.35. The interest rate is 8.25%.
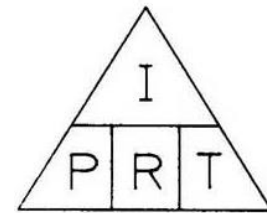Find the interest portion for the month.

Solution

We find interest for the month on $45 000 using I = Prt
I = we need to find
P = the amount owing on the mortgage loan = $45 000
r = rate (written as a decimal, not as a %) = 0.0825
t = time (in years, so 1 month is 1/12 of a year) = $\frac{1}{12}$ (or divide by 12)

$45 000 x 0.0825 ÷ 12 = $309.38 is the interest portion for the month

Why are these two numbers not the same?

Mortgage Example – Unpaid Balance and Owners Equity

The unpaid balance last month was $23 472. The owner's equity last month was $18 785. The principal paid this month is $75.68.

Calculate the new unpaid balance and the new owner's equity.

Solution

New Unpaid Loan Balance = Past Unpaid Loan Balance - Principal

$23,472.00 - $75.68 = $23,396.32 is the New Unpaid Loan Balance

The Unpaid Loan Balance **decreased**. Is this what you expected would happen?
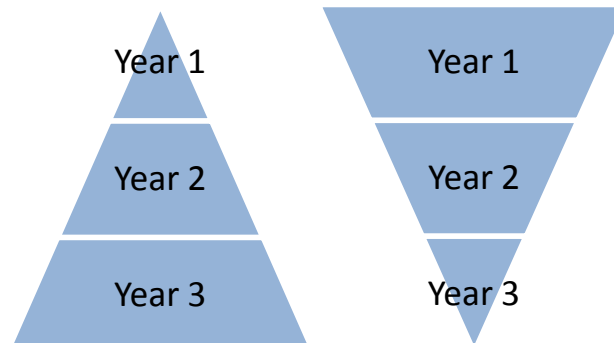
New Equity Balance = Past Equity Balance + Principal

$18,785.00 + $75.68 = $18,860.68 is the New Owner's Equity

The Owner's Equity Balance **increased**. Is this what you expected would happen?

Which of the following diagrams represents the trend of the Unpaid Loan Balance?

Which one represents the trend of the Owner's Equity Balance?

Year 1	Year 1
Year 2	Year 2
Year 3	Year 3

Example 1:

Jack Palmer purchases a home for $120 000. He makes a down payment of $40 000 and takes out a fixed-rate mortgage at 4.5% for the balance of the purchase price. The mortgage is to be amortized over 20 years. Determine Jack's monthly mortgage payment.

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4.75%	18.74	10.46	7.75	6.44	5.67

Example 2:

Calculate the amount of interest Jack pays during the 20-year amortization period.

Example 3:

a) Find the interest portion for Jack's first month mortgage repayment.

b) Explain where the remaining amount of his monthly mortgage payment goes.

Assignment 3B: Mortgages

1. Arlin takes out a mortgage of $160 000 from the bank for 20 years at 4.75%. Determine her monthly mortgage payment.

2. You take out a mortgage of $150 000 from the bank for 25 years at 4.25%. Calculate the monthly mortgage payment.

3. Tom buys a house and borrows $75 000 over a period of 15 years at a rate of 5.5%. Find his monthly mortgage payment.

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5.25%	18.96	10.70	8.01	6.71	5.96
5.50%	19.07	10.82	8.14	6.84	6.10

4. Sam borrows $240,000 at 8.75%. Determine the interest portion will he pay in the first month.

5. You owe $95 000 at 9.75%. Calculate the interest portion will you pay in this month.

6. Jane takes out a 25-year mortgage for $320 000 at 5.25%. Determine the interest would she pay over the life of the loan.

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7. You pay $675.75 per month for your mortgage and the interest portion you pay this month is $602.08. Determine the principal portion you have paid.

8. Ellen pays $453.00 per month on her mortgage. This month $337.50 goes to the interest portion. Calculate the principal portion she will have paid this month.

9. The unpaid loan balance on Juan's mortgage was $43 724 and the owner's equity balance was $15 587. The monthly mortgage payment principal portion for this month is $68.75.
a) Determine the new unpaid loan balance.

b) Determine the new owner's equity balance.

10. Sam and Laura's monthly mortgage payment is $532.31. After their March payment, the unpaid balance is $51 284.62 and the owner's equity is $25 634.10. From the April payment, $404.44 is the interest portion.

a) Determine the new unpaid loan balance at the end of April.

b) Determine the new owner's equity balance at the end of April.

11. Explain why you pay less interest in the second month of a mortgage than in the first month.