

## Introduction to Financial Calculations

The whole area of Financial Calculations can often put a person to sleep; mainly because it is a bit of a dark art to many people. We believe that if you understand the principles of the process, you don't have to understand the high level maths behind them. After all, you are a Financial Planner, not a Mathematics Professor!

In this paper, we will cover three main types of calculations:

1. Loans
2. Investments
3. Life of Capital

The main purpose here is to introduce the business concepts behind the calculations. For more information about how the calculations work, please see the other tutorials on this site ([www.CalculateMyLifestyle.com](http://www.CalculateMyLifestyle.com)).

### *Financial Strategy*

**Benefit:** *Setting the correct targets and objectives will ensure that you are concentrating on the right financial priorities, rather than treating them one at a time and maybe missing the big picture.*

Many people make financial decisions in isolation, for example taking a loan. However, this process also affects other parts of their daily lives; i.e. they have less money available each month because part of their money now goes to servicing the loan.

This may be the correct decision in certain circumstances, but in general the big picture should never be completely ignored.

Each individual has a different financial strategy, and the factors that determine this strategy are wide ranging. Sometimes, they may be very emotional, and not even logical. This does not necessarily mean they are invalid. However, for the purposes of this paper, we will assume a level of logic for all decisions – after all the emotive issues are very personal, and we could never deal with them all here.

Some of the important issues include:

- A financial strategy is required to “direct” us when making decisions for purchasing assets, borrowing money or protecting assets.
- Understand how much it takes to survive comfortably in the future.
- Have a plan for when you want to slow down or retire.

- Do you know what kind of investor you are? Risk averse, or willing to take high risks?

All the factors (and more) should be taken into account whenever a financial decision is planned.

### Loan Calculations

We all have, at some time in our lives, borrowed to buy something, but how many of us really think about the repayment calculations? Most of us are so happy that someone is actually willing to loan us money that we forget to look at the options available, and we often jump at the first offer.

Two main loan types prevail:

*Repayment Loans*; where we pay the interest each month, and a little off the amount borrowed (principal). As time moves on, and the principal reduces, then more of the repayment goes towards paying the loan.

*Interest Only*; where we service the interest on the loan throughout a specified term, after which we pay back the amount borrowed in one balloon payment.

It may be obvious, but *the longer a loan remains in place, the more expensive it becomes*. This is because you pay interest for a longer term. As an example, let's take a standard mortgage calculation. A mortgage of \$350,000 at 4%:

Term	Total Repayment
20 years	\$505,836
25 years	\$550,091

So, a difference of 5 years in the mortgage term costs over \$44,000 in extra interest!

When taking a loan, there are several important variables:

1. Amount Borrowed
2. Repayment Amount
3. Repayment Period in Years
4. Interest Rate

Most people know either how much they can afford, and want to find out how much they can borrow, or are offered an amount and want to know how much it will cost.

However, if you know any three, you can calculate the fourth. This makes the Loan calculations much more interesting.

For all these examples, we will assume the payment is made monthly:

Example	
\$350,000 at 4% over 20 years	We can find the Repayment: \$2,107
Repayment of \$1,500, at 4% over 20 years	We can find how much we can borrow: \$249,000
\$350,000, paying \$2,000, over 20 years	We can find the Interest Rate: 3.38%
\$350,000 at 4%, paying \$2,500	We can find the Repayment Term: 15.6 years

### ***Investment Calculations***

When investing our hard-earned cash, we want to make sure it is working for us. If we invest at a rate that is lower than the rate of inflation, then we are effectively losing money. Therefore, we need to manage our investments carefully, and keep one eye on them at all times.

Remember the old axiom – “*the earliest investment works the hardest*”. This is because the longer an investment is working the more interest it will accrue.

When making an investment, there are several important variables:

1. Investment Amount
  - a. Lump Sum
  - b. Regular Amount
2. Investment Period in Years
3. Expected Return Rate
4. Future Value of the Investment

If you know any three, the fourth can be calculated.

For all these examples, we will assume the Regular Payment Amount is made monthly:

<b>Example</b>	
Lump Sum of \$50,000 over 5 years, at 6%	We can find the Future Value: \$66,911
Regular Amount of \$500 over 5 years at 6%	We can find the Future Value: \$35,851
Lump Sum of \$50,000 and a Regular Amount of \$500 over 5 years at 6%	We can find the Future Value: \$102,762
Regular Amount of \$500 at 6%, Future Value of \$45,000	We can find the Investment Period: 6.07 years
Regular Amount of \$500 over 5 years, Future Value of \$40,000	We can find the Return rate: 9.75%
Future Value of \$50,000 at 6% over 6 years	We can find the Regular Amount: \$563
Future Value of \$50,000 at 6% over 6 years	We can find the Lump Sum: \$35,248

*Remember that when you are dealing with Future Values, you should always get the Net Present Value of the amounts, so that they are expressed in today’s terms. Otherwise, you are looking at an inflated figure.*

### ***Life of Capital (LoC) Calculations***

Often, we need know how long a lump sum will last if we regularly draw down a fixed amount. This is particularly important when calculating Life Cover, or Pension Provisions.

For example, if you have a lump sum of \$500,000 on which you receive 6% interest and want to withdraw \$35,000 every year. The big question is “*how long before you run out of cash?*”

When making a Life of Capital calculation, there are several important variables:

1. Lump Sum (Capital Available)
2. Draw Down (how much you want to take out on a regular basis)
3. Period (How long the Lump Sum will last)
4. Return Percentage (the Investment Return on the Lump Sum)

If you know any three, the fourth can be calculated.

For all these examples, we will assume the Draw Down is made Yearly:

<b>Example</b>	
\$500,000 Lump Sum at 6%, drawing down \$35,000	We can find the Period:28.3 years
\$500,000 Lump Sum at 6% over 20 years	We can find the Draw Down: \$41,124
\$500,000 Lump Sum, drawing down \$50,000, over 20 years	We can find the required Return: 3.87%
Draw Down \$50,000 over 30 years, assuming 6% Return Rate	We can find the Lump Sum: \$729,535

When making LoC calculations, it is important to take inflation into account, so the draw down amount should increase every year in line with inflation.