

# CashCalc Specification Sheets (Client Facing)

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## Mortgage & Equity Release Calculator

### Overview

The Mortgage & Equity Release Calculator is used for showing the client how much their monthly/annually mortgage repayments would be. This calculator takes the Date the Mortgage has started, Amount Borrowed, Interest Rate, Term, Extra Monthly Payments (if Roll up interest is not selected), whether the mortgage is Part Interest Only/Part Repayment (and if it is it takes the Part Interest Amount), a Roll up Interest or Interest Only

### Assumptions

Below is a list of all assumptions made in order to perform the calculation:

- Figures are rounded to the nearest pound
- Interest Rate can be set as the user desires
- Interest Rate is on a yearly basis
- Term input is in years
- There is an option for the client to make optional monthly payments
- There is an option to view part interest only repayments, or interest only one
- Roll up Interest is calculated monthly
- Values are in today's terms

### Calculations Breakdown

The calculations require nine parameters in order to calculate the given output, these being:

- Start Date
- Amount Borrowed
- Interest Rate %
- Term
- Extra Monthly Repayments
- Part Interest Only / Part Repayment
- Part Interest Amount
- Roll Up Interest
- Interest Only

The Mortgage & Equity Release Calculator uses these values to estimate what the client's monthly repayments on their mortgage would be, calculating the Total Payment, Interest, Capital, Monthly End Balance, and if the Term was reduced by Extra Payments calculates by how much and the Amount Saved.

The Total Payment is calculated by taking the Scheduled Payment and adding any Extra Monthly Payments to it. The Scheduled Payment is calculated by finding the product of the monthly interest rate multiplied by the balance at the beginning of the month and then dividing that by one minus one plus the monthly interest rate to the power of the number of months in the term, turned negative to produce a valid output. Following are the calculations performed in this process:

$$\text{Monthly Interest Rate} = \frac{\text{Annual Interest Rate}}{12} / 100$$

$$\text{Scheduled Repayment} = \frac{\text{Monthly Interest Rate} \times \text{Balance at Start}}{1 - (1 + \text{Monthly Interest Rate})^{(\text{Months in Term} \times (-1))}} + \text{Extra Repayment}$$

The interest that the client would be paying monthly is calculated by multiplying the balance at the start of the month by the monthly interest rate. If the client were to only be paying the interest on their mortgage, their monthly payments would be the Monthly Interest. Following is the calculation performed in this process:

$$\text{Monthly Interest} = \text{Balance at Start of Month} \times \text{Monthly Interest Rate}$$

The difference between these two values is the capital; this is subtracted from the balance at the start of the month to calculate the balance at the end of the month. Following are the calculations performed in this process:

$$\text{Capital} = \text{Scheduled Payment} - \text{Monthly Interest}$$

$$\text{Balance at End of Month} = \text{Balance at Start of Month} - \text{Capital}$$

If the client were to have a part repayment, the scheduled repayment would be calculated by finding the product of the monthly interest rate multiplied by the product of subtracting the part interest amount from the balance at the beginning of the month and then dividing that by one minus one plus the monthly interest rate to the power of the number of months in the term, turned negative to produce a valid output. The part interest amount multiplied by the monthly interest rate and any extra repayments are then added to this value. Following are the calculations performed in this process:

$$\text{Scheduled Repayment} = \frac{\text{Monthly Interest Rate} \times (\text{Balance at Start} - \text{Part Interest Amount})}{1 - (1 + \text{Monthly Interest Rate})^{(\text{Months in Term} \times (-1))}} + (\text{Part Interest Amount} \times \text{Monthly Interest Rate}) + \text{Extra Repayment}$$

If the client has a roll up interest, the interest would be recalculated every month and added to the beginning balance of that month. There is no monthly repayment as the interest paid at the end of the month or year, but at the interest is added to the current amount of the loan every month. This is done every month with the values from the previous month, following the calculation:

$$\text{Balance at End of Month} = \text{Balance at Start of Month} + \text{Monthly Interest}$$

This calculator provides the user with the option to view payments both monthly and annually, it does this by multiplying the values produced for each month by 12, making it a year.

A PDF report can be created from this calculator which contains detailed information about the relevant client's details and the outputs of the calculations performed.