RetirementWorks®

Basic Financial Calcs

The RetirementWorks® Basic Financial Calcs module provides a variety of useful calculation utilities packaged into three groups, described below. These utilities enable you not only to perform quick financial and life expectancy calculations, but also to produce (if you wish) detailed reports for your client to illustrate the results. Eight basic kinds of calculators are available in this module:

Present Value, Future Value, Internal Rate of Return

- Future value of a lump sum and/or of periodic payments, or of a varying set of payments specified on a year-by-year basis;

- Cost of delay in starting a savings program (how future values decrease if periodic payments are delayed);

- Present value of a lump sum and/or of periodic payments, or of a varying set of payments specified on a year-by-year basis;

- Internal Rate of Return on a lump sum and/or periodic payments into and out of a fund, or on a varying set of payments specified on a year-by-year basis.

Amortization

- Annuity payments (i.e., payments made at the beginning of a term); you can solve for the principal, number of payments, interest rate, or periodic payment amount.

- Loan payments (i.e., payments made at the end of a term); you can solve for the principal, number of payments, interest rate, or periodic payment amount.

- Mortgage payments (i.e., loan payments where interest is tax-deductible); you can solve for the principal, number of payments, interest rate, or periodic payment amount, and illustrate pre-tax and after-tax costs.

Life Expectancy

- Life expectancy for a single individual, or for two individuals, including first-to-die and second-to-die expectancy; takes into account age, sex, smoking status and health impairments; shows life expectancy at 50% probability of survival, and at a wide range of other probabilities.

When to Use These Calculators

These calculators are made available as utilities, often for quick, "off-line" answers to basic questions. For this reason, we do not include inputs to these calculators when you print out an Assumptions report.

Nonetheless, some calculators such as the Cost of Delay, Mortgage Amortization, or Life Expectancy, make important points that you may want to emphasize with your clients, and you will find the hard copy output especially useful in these cases.

How to Use These Calculators

These calculators are intended to be pretty easy to use. All of them require only a small number of inputs, occurring on a single screen (except, in the first group, if you prefer to enter year-by-year detail, which is on a separate screen).

First determine, from the list on the preceding page, which group the calculator you want appears in. Then find that screen in the RetirementWorks® calculator list. If you don't see it on the list, but you do see "Basic Financial Calcs" listed, simply click on that entry, and the three calculator group choices will appear underneath.

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Detailed Input Instructions – Present Value / Future Value / IRR

Indicate at the top of the screen which type of calc you are doing. The same set of input fields is used for each kind of calculation, except that, when you indicate the calc type, certain fields below will be opened up or made unavailable, as applicable. The various calc types are described in more detail on the following page.

For any calcs other than Cost of Delay, you can choose "Year by year input" as the "Cash flow input mode" near the top of the input screen. Year by Year mode will enable the Detail button which, if you click it, will pop up the Year by Year input window. The Year by Year input window allows you to enter completely different values for each future year, though you are limited to annual inputs (not monthly or weekly, for example). See page 5 for more information.

All calculation types can produce a quick answer (which appears at the bottom of the screen when you click the Calculate button at the lower left corner). Or you can preview and/or print a detailed report that shows the cash flows that result from the inputs you defined; the detail

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reports are always on an annual basis, even if the payment frequencies are more often than that.

Lump sum amounts are always specified as occurring a certain number of years from now. Current balances or immediate inflows, therefore, should be entered as occurring in zero (0) years, which is the default.

All periodic payments, in or out, are considered to occur at the beginning of the period indicated. Therefore, a payout that begins ten years from now (as input on the screen), will show on the printed report as occurring at the beginning of year 11. This is consistent with the lump sum instruction above: lump sums that occur in 0 years appear as happening at the beginning of year 1.

Future Value Calc. You can input lump sum and/or periodic payments into a fund using the fields in the middle portion of the screen, or use the Year by Year detail input. You should enter an assumed annual rate of return. You must also make a Future Value Years from Now entry, so that the system knows at what future time you want the future value to be calculated.

Cost of Delay Calc. You can input lump sum and/or periodic payments into a fund using the fields in the middle portion of the screen, but not the Year by Year detail input. You should enter an assumed annual rate of return. You must also make a Future Value Years from Now entry, so that the system knows at what future time you want the future value to be calculated. And you must enter a number of years for the delay to be illustrated. Only periodic payments will be delayed by this number of years; any lump sum payment will not be delayed (since in most cases this will represent a current balance, which is the same regardless of what happens to future periodic payments).

Present Value Calc. You can input lump sum and/or periodic payments out of a fund using the fields in the middle portion of the screen, or use the Year by Year detail input. You should also enter an annual rate of return. The detail report will show the calculated present value as the Starting Balance, then illustrate how that balance grows with interest but is eventually paid out to a zero balance over time.

Internal Rate of Return Calc. You can input lump sum and/or periodic payments into and out of a fund using the fields in the middle portion of the screen, or use the Year by Year detail input. Normally, payments both in and out should be entered. Lump sums are assumed to be payments in, not out. If there is only one payment out, or if the final value represents an account balance rather than a payment out, then enter it as an annual payment out, lasting for one year. When the input is complete, the system will calculate, if possible, the interest rate needed to make all

payments in and out with no balance left over.

Note that annuity and loan interest rates are a little different from rates of returns on savings. In loan and mortgage calculations, the annual interest rate is divided by twelve to determine the monthly interest. In investment accounts, an annual rate of return is assumed to compound evenly over the year. Therefore, a present value or future value calculation using, say, monthly payment frequencies will properly reflect somewhat different values from an annuity, loan or mortgage calculation using the same amounts, frequencies and nominal annual rates.

Year by Year Data

The Year by Year Data screen appears when you select "Year by Year" input for cash flows on the Present Value / Future Value / IRR screen and click the Detail button.

Inputting individual values into the grid: Use your mouse, tab key, or up or down arrow keys to move to the year you want. Positive or negative numbers may be entered.
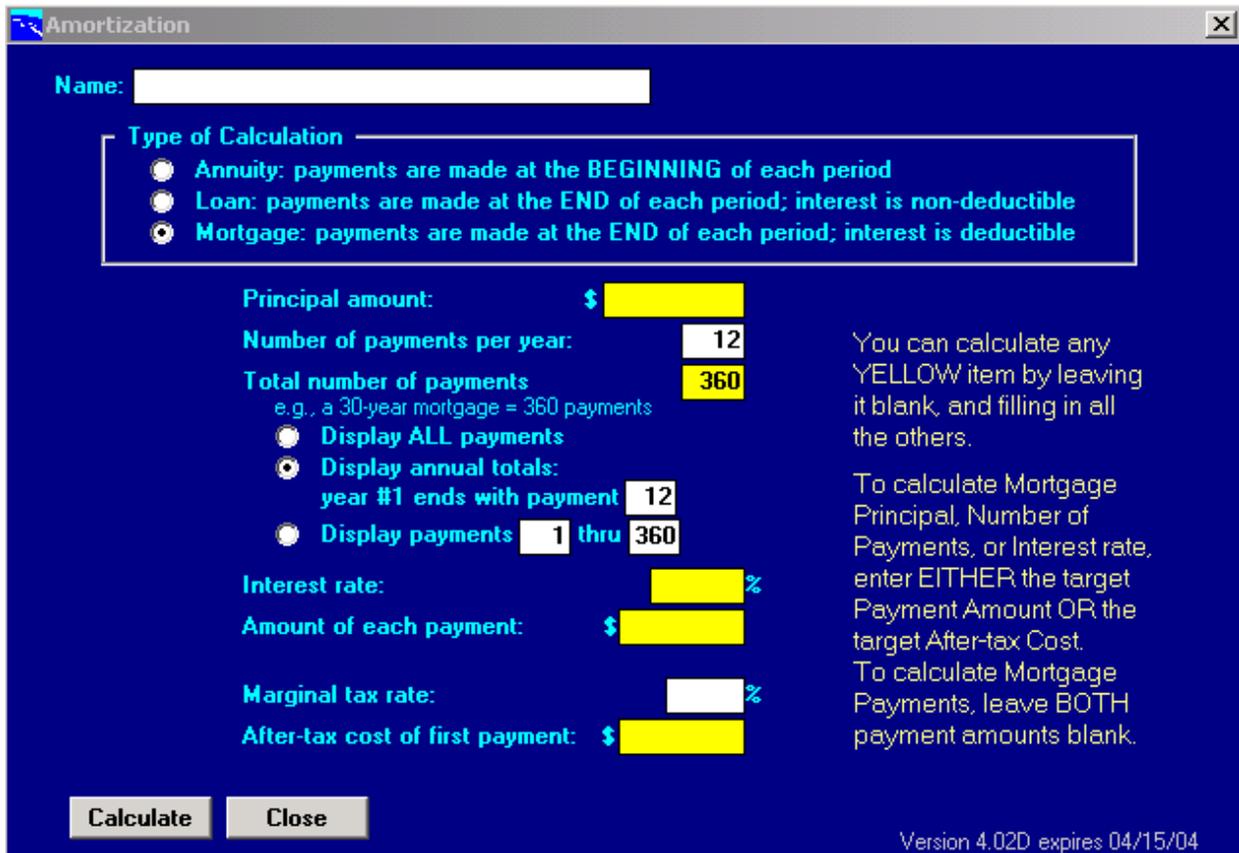
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Inputting or clearing multiple values simultaneously: You may use only your mouse to highlight multiple years. (But you cannot start the highlighting with the field that is already highlighted. If you need to do so, first click on another year to move the highlighted field, then click and drag your mouse to highlight the years you wish.) When multiple fields are highlighted, the "Options for multi-cell entries" section will be enabled at the right-hand side of the screen. First select the option you want (same value in all fields, values increasing by a certain percentage each year, or clear). Second, if you chose the first or second option: for the first option, enter the value you want to appear in each selected field; for the second option, enter the positive or negative percentage by which values should change each year (using the last entry before the selected fields as a base). Third, click the "GO" button to actually create the changes.

Closing the screen: To save your changes, click on the "Close" button on the bottom of the screen. If you click the "Cancel" button or use the "X" at the top right corner of the screen, your changes will be lost.

Detailed Input Instructions – Amortization

This screen is used to input data for annuity, loan amortization, and mortgage amortization calculations. Indicate at the top of the screen which type of calc you are doing. The same set of input fields is used for each kind of calculation, except that, when you indicate the calc type, certain fields below may be opened up or made unavailable, as applicable. The various calc types are described in more detail on the following page.

Some input fields have a yellow background. **You should leave one of the yellow fields empty; the empty one is the one that will be calculated.** (For **mortgages**: if you are calculating the payment amount, leave both the Amount of Each Payment and the After-tax Cost of the First Payment blank; however, if you are calculating one of the other values, then you need to enter either the Amount of Each Payment or the After-tax Cost of the First payment, but not both.)

All calculation types can produce a quick answer (which appears at the bottom of the screen when you click the Calculate button at the lower left corner). Or you can preview and/or print a

detailed report that shows the cash flows that result from the inputs you defined. The radio buttons in the middle of the screen, under Total Number of Payments, indicate which payments will be illustrated on the report.
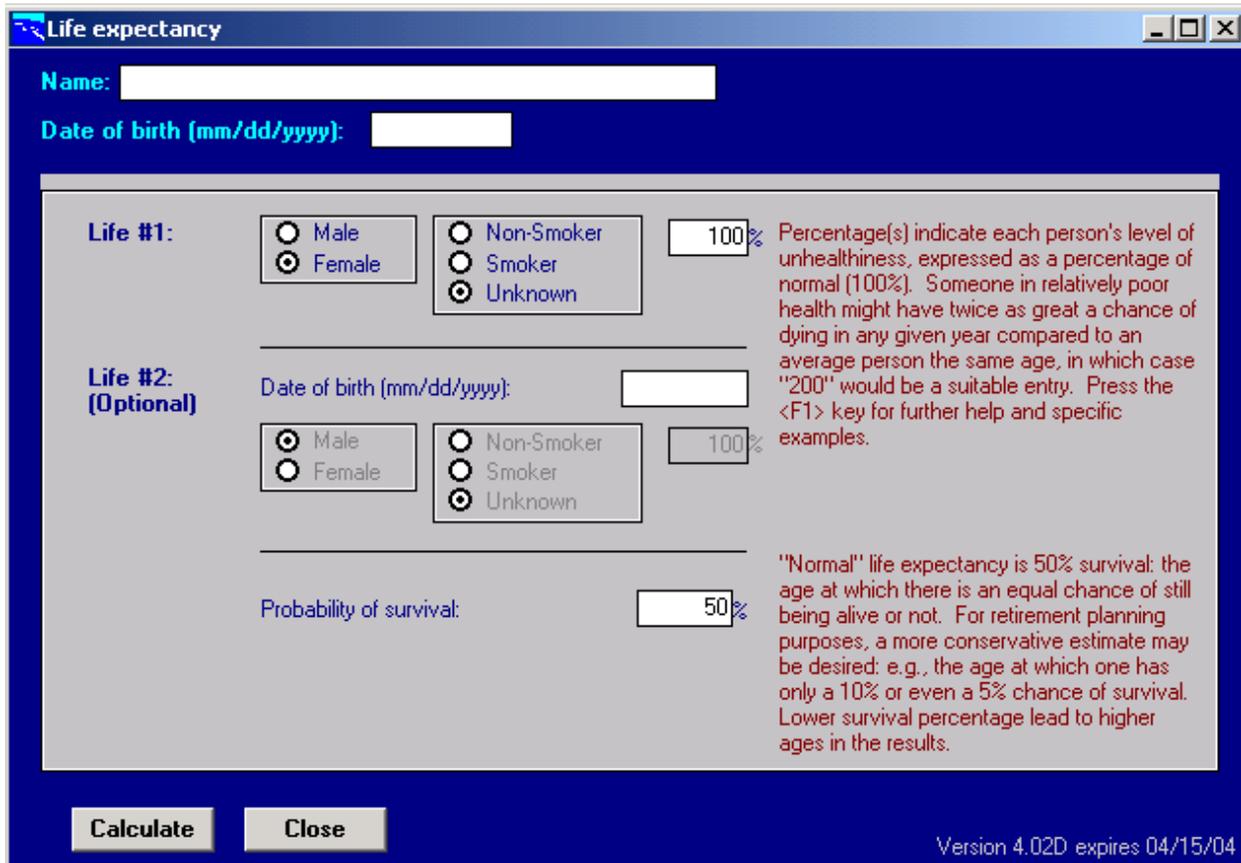
Annuity Calcs. This is not an immediate annuity illustration. In financial parlance, an "annuity" is a periodic payment that is made at the beginning of each period. In other words, it is exactly like a loan, except that the payment occurs at the beginning of each month or year (or whatever), instead of at the end. There is no mortality component, and taxes are not taken into account.

Loan Calcs. Loan calculations show how a loan is amortized over time. The loan calculation is identical to the mortgage calculation, except that the mortgage is assumed to have tax-deductible interest payments. No tax effects are shown on loan payments.

Mortgage Calcs. A mortgage is just a loan. The only difference in the calculator is that for mortgage calcs you can enter a marginal tax rate, in which case the printed report will show the tax savings and the net after-tax cost of payments made. You can also calculate backwards from the after-tax cost of the initial payment (so, for instance, you can determine what size mortgage a family could afford based on their after-tax income available to make payments). You can also put the report in sync with the client's tax year by selecting annual totals for output, and indicating which mortgage payment was the last one of the first tax year (e.g., if the first payment was in October, there would be three payments in the first tax year).

As noted before: in loan and mortgage calculations, the annual interest rate is divided by twelve to determine the monthly interest. In investment accounts, an annual rate of return is assumed to compound evenly over the year. Therefore, a present value or future value calculation using, say, monthly payment frequencies will properly reflect somewhat different values from an annuity, loan or mortgage calculation using the same amounts, frequencies and nominal annual rates.

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Detailed Input Instructions – Life Expectancy

The client name and date of birth (which is mandatory) go at the top of the screen. If there is a second life, enter the second date of birth, and then the sex, smoking, and health status fields will also open up.

The Probability of Survival field toward the bottom defaults to 50%, which means normal life expectancy will be calculated. In other words, the client has a 50% chance of surviving to that age or beyond. For many retirement planning purposes, however, it is good to have an idea of the odds of living longer than that. If you change the survival percentage to, say, 10%, the system will calculate the age at which the client has only a 10% chance of living - so lower percentages mean higher ages, and vice versa.

Printed reports will show expected ages at a wide range of survival percentages. If there are two lives, the report will calculate individual life expectancies for each person individually, plus

first-to-die and second-to-die life expectancies for the pair (expressed as the age of the client at the first or second death, regardless of whether the client is actually the first or second to die).

The other fields on this screen are mostly self-explanatory: sex and smoking status for the client (and for a second person, if applicable). Smoking status should be considered to be the general past practice. If someone has just recently quit after a long period of smoking, you should still enter him or her as a smoker.

In addition, there is information requested about health impairments. The mortality percentages to the right of the smoking status indicate how much more likely to die a medically impaired person is, compared to normal. A normally healthy person has a 100% mortality rating. Someone twice as likely to die in the next year has 200% mortality, someone three times as likely has 300% mortality, and so on. (For people in the insurance business, these last two would be Table D and Table H respectively.) If you don't do this for a living – and even if you do – it's hard to estimate a mortality percentage. Many common conditions and approximate percentages are provided in the on-line help, though.