

## Table Mode guide for Casio calculators

This guide is designed to explain how to use Table Mode on most Casio calculators. Models fx-85 GTX and fx-83 ES were used when writing this guidance. Other models may differ slightly.

Table Mode is useful for answering questions involving trial and error. Multiple iterations can be used to obtain an answer to the desired level of accuracy.

The instructions below describe the steps to follow when using Table Mode. We then give a worked example.

### Using Table Mode

1. Select Table Mode by hitting the MODE/SETUP or MENU/SETUP button, then 3. This will take you to a screen with  $f(x)=$ .
2. Type in the formula you want to solve, using  $x$  as the unknown value. You can key in  $x$  using the ALPHA key and then the close bracket key,  $)$ .
3. Hit  $=$  to get to the screen(s) for setting the start value, end value and steps for your table of results. You may need to hit  $=$  twice to get to the relevant screen, as some models will show  $g(x)=$  before this.
4. Enter the start value, end value and steps (increments) you want in your table, using  $=$  to scroll between entries. If the start, end and step values show on the screen simultaneously, then you can also use the up and down arrow keys to scroll between them.
5. Once you've keyed in all required values, hit  $=$  to generate your table of results. This shows the values of  $f(x)$  to 4 or 5 significant figures for all values of  $x$  specified in step 4. To see more decimal places, scroll through the table.
6. Note that the figures shown in the table are truncated. To see more decimal places, scroll through the table. When the cursor is placed on a value, a more accurate figure will appear at the bottom of the screen.
7. Use the AC key to navigate back to the  $f(x)=$  screen and repeat steps 2 to 6 again if needed.

**Tip:** if using only Table Mode to find an answer in an exam, it is advised that you write out a few values from the table so the examiner can see some of your workings. While full marks will usually be awarded for a correct answer, simply writing down one result and 'found using Table Mode' can limit the number of method marks awarded if you go wrong somewhere.

## Worked example

Using Table Mode to answer the following question:

*A payment of £5,500 is invested for 4 years, then £1,000 is added at the end of the fourth year. This total is then invested for a further five years. Calculate the effective annual rate of interest achieved if the total after the nine years is £10,200.*

We want to find the annual effective rate of interest,  $i$ , that solves the equation of value:

$$5,500 \times (1+i)^9 + 1,000 \times (1+i)^5 = 10,200$$

Hit MODE/SETUP or MENU/SETUP, then 3 to select Table Mode and key in the formula above in the  $f(x)=$  screen using  $i = x$ , ie:

$$f(x) = 5,500 \times (1+x)^9 + 1,000 \times (1+x)^5$$

To key in  $x$ , use the ALPHA then open bracket keys.

Hit = once or twice (you may need to cycle past the  $g(x)=$  screen depending on your calculator model) until you get to the screen where you can enter the starting point for the set of calculations we're going to produce. This screen may be titled 'Table Range'.

We're finding a rate of interest here, so a sensible range for our answer could be 1% to 10%. We'll generate results in this range, using increments of 1%.

**Tip:** *try to avoid making the range too big as the calculator might take a long time to perform the calculations and the table produced can be quite difficult to navigate. Asking the calculator to perform too many calculations in one go may also result in an error.*

To set the starting point key in 0.01 (ie 1%), hit = once to enter the end point of 0.1 (ie 10%) and again to enter the steps of 0.01. Hit = one more time to generate the table of results.

The table of results produced is shown on the following page.

## Results

	$x$	$f(x)=$
1	0.01	7,066.2
2	0.02	7,677
3	0.03	8,335.5
4	0.04	9,044.8
5	0.05	9,808.5
6	0.06	10,630
7	0.07	11,514
8	0.08	12,463
9	0.09	13,484
10	0.1	14,579

From the above, we can see that the value of  $f(x)=$  we're looking for is between results 5 and 6, *ie*  $x$  is between 5% and 6%.

To obtain a more accurate answer, press AC, then = to accept the  $f(x)=$  function, change the start value to 0.05, the end value to 0.06 and the step size to 0.001. We find that the interest rate is between 5.4% and 5.5%, and that it's closer to 5.5%.

To obtain an even more accurate answer, repeat the process using a start value of 0.054, an end value of 0.055 and a step size of 0.0001. Doing this, we find that the interest rate is between 5.48% and 5.49%.

Repeated iterations remove the need for interpolation (which is less accurate anyway).