MICRO MATHS
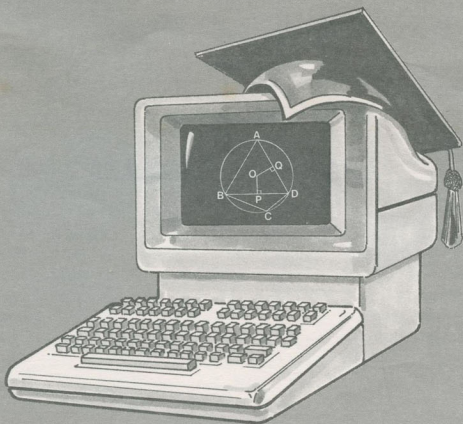

24 EASY TO USE PROGRAMS FOR 'O' LEVEL REVISION OR SELF TUITION

LCL

Loading Instructions

LCL Micro Maths is a complete self-tuition and revision course, taking beginners up to CSE O-level standard. It is designed to be used both in schools and in homes. It is written for the Amstrad CPC464, CPC664 CPC6128 and any other computers using Amstrad (Locomotive) Basic.

Put the tape or disc you require into the computer and then key in cpm"menu" followed by pressing the Return or Enter key. Now select the program you require in the normal way.

LCL

In cassette versions, the same programs are recorded both sides to reduce any loading problems.

Operating Instructions

On the CPC464 and CPC664 there are two keys marked Enter. In Micro Maths these keys have different uses. To simplify matters I shall call the larger Enter key on the 464 and 664 the 'Return' key as it is called on the 6128 and the small Enter key the 'Enter' key.

Micro Maths

Each program in ... asks you your name, then sets you a problem.

If the answer is a number omit any units, e.g. key in 4 not 4cm. Answers are normally considered correct if they are within 0.1 of the calculated answer. If the number is alphanumeric (i.e. a mixture of letters and numerals) then omit any unnecessary spaces, brackets, addition signs and zeroes preceding whole numbers. For example key in X+2 not (+X +02). Use '^' to represent to the power of, e.g. X^2 is X...

Remember throughout all these problems to press Return after keying in the required response. If you have no idea of what the required response should be then just press Return on its own.

The correct response for some of the problems in the programs on Vectors and Matrices takes up two screen lines. In this case key in each line separately pressing Return after each line. If you have no idea of what the response should be then press Return twice.

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On the CPC464 and CPC664 there are two keys marked Enter. In Micro Maths these keys have different uses. To simplify matters I shall call the larger Enter key on the 464 and 664 the 'Return' key, as it is called on the 6128, and the smaller Enter key the 'Enter' key.

Each program in Micro Maths first asks your name, then sets you a problem.

If the answer is a number, omit any units, e.g. key in 4 not 4cm. Answers are normally considered correct if they are within 0.1 of the calculated answer. If the answer is alphanumeric (i.e. a mixture of letters and numbers) then omit any unnecessary spaces, brackets, addition signs and zeroes preceding whole numbers. For example, key in X+2 not (+X +02). Use '↑' to represent 'to the power of', e.g. X↑2 is X squared.

Remember, throughout all these problems to press Return after keying in the required response. If you have no idea of what the required response should be then just press Return on its own.

The correct response for some of the problems in the programs on Vectors and Matrices takes up two screen lines. In this case, key in each line separately pressing Return after each line. If you have no idea of what the response should be then press Return twice.

If you get the answer right,"Yes,congratulations"
is displayed and then you are asked "Do you want
more? (Y/N)". If you then press y (Return or Enter)
another problem is displayed. If you press N,the
program ends. Then ,in tape versions,the next
program is loaded,and in disc versions the menu is
loaded. In all the above "Return or Enter" refers to
the Return key on the CPC6128 or the larger Enter
key on the other computers.

If you get the answer wrong,you are given a hint or
some Maths instruction and then are told to try
again. If you get it right this time,the program
proceeds as described above. If not,the correct
answer is given,followed by a complete explanation.
Then the program proceeds as described above.

Calculator mode

If you require a calculator to calculate the result
of a problem then make sure your disc,if any,is
still in the drive,then press function key 0 to
enter the Calculator mode. In this mode the computer
acts like a calculator,for example,to add numbers 12
and 39 just key in:

12+39 (Enter)   Note:smaller Enter key on 464

 You must use the small Enter key in the numeric
keypad in the 464 and 664,and the Enter key in the
128. Do not use the larger Enter key or the Return
key,failure to do this may force you to reload the
program. The small Enter key causes a question mark
to be displayed and this must not be deleted.

The Trigonometry functions of 10 degrees,say,are:

SIN(10),COS(10),TAN(10) and ATN(0.1),×(multiply),/(divide)

where ATN stands for arc-tan. Brackets may also be
used. To exit the Calculator mode press function key
0 again.

For further information on these or other programs
write to : LCL,26,Avondale Ave.,Staines,Middx.

Program notes

The programs are as follows:

MENU. There is a different menu on each tape, or side of disc. Pressing Return (or large Enter) after it starts running skips over the tune and special effects.

Micro Maths 1

PERCENTAGES. When converting fractions to percentages, ideally write the answer to two decimal places. When converting percentages to fractions, use the / symbol when keying in fractions, e.g. 2/3. Remember to omit any unnecessary spaces.

AVERAGES AND HISTOGRAMS. It covers histograms and means (averages). Histograms are charts consisting of long, thin bars (or rectangles) drawn side by side. The height (or length) of each bar is the number of occurrences of the condition represented by that bar.

RATIO AND PROPORTION. Use the symbol / when expressing one value as a proportion of another value.

CHANGING THE BASES OF NUMBERS. It includes the conversion of denary numbers to binary, and octal numbers to denary.

OPERATIONS ON NUMBERS IN DIFFERENT BASES. It covers binary addition, octal subtraction and binary multiplication. If you can not work out the answer in your head, you may enter the Calculator mode and calculate the result of each pair of digits, going from right to left.

POLYGON PROPERTIES. This covers the calculation of the sum of the interior angles of a polygon, and the value of any angle in a regular polygon. A five-sided polygon with interior angles marked is shown below.
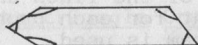
SOLUTION OF ALGEBRAIC EQUATIONS. These equations are
solved by adding, subtracting or dividing a value
into both sides of the equation, or by a combination
of these operations.

SIMPLIFICATION OF BRACKETED QUANTITIES IN ALGEBRA.
This involves multiplying an expression by a
constant, and also by another expression.

SIMPLE AND COMPOUND INTEREST. In the formulae given
the letters have the following meaning:

P is the principal, that is the amount of money lent
T is the time in years for which the money is lent
R is the rate of interest in percent per annum
I1
I2 are the interest paid in the first and second
   years respectively
I is the total compound interest

Interest is the charge made for lending money.

SOLUTION OF TRIANGLES USING SINE AND COSINE FORMULAE
This covers the solution for either acute or obtuse
angled triangles. The notation used is that the
length of a side has a lower case letter, while the
corner opposite it has a capital letter.

PROFIT AND LOSS. Problems on percentage profit, and
selling price given a profit are set.

Micro Maths 2

SIMILAR TRIANGLES. It covers both the identification
of similar triangles, and problems using them. In the
identification section you are given details of two
triangles, ABC and PQR, and asked if they are similar.
You must answer Y or N (for yes or no respectively).
The second section sets problems on similar
triangles.

GEOMETRY OF THE CIRCLE AND ITS CHORDS. In these
problems the length of the lines and angles in the
diagram are different for each problem, even though
the same shape diagram is used.

ADVANCED STATISTICS. It covers Pie Charts, modes and medians. The Pie Chart used is shown below and you are required to find the angle marked.

APPLICATIONS OF PYTHAGORAS THEOREM. This covers the application of this theorem to right-angles and isosceles triangles. Isosceles triangles have two sides of equal length (AB=AC in the diagram below). Any line drawn from A to BC, that is at right-angles to BC, bisects BC (i.e. cuts BC in half).

TRIGONOMETRY. It contains problems in which either two sides, or a side and an angle of a right-angled triangle is given, and you are required to find the remaining side or angle using sine, cosine or tan. rules.

FACTORISATION OF ALGEBRAIC EQUATIONS. Two types of equations are used, standard quadratic and those solved by the 'difference of two squares' method. This latter type has no X term.

GRAPHS. This is on calculating the values needed to draw graphs of linear and quadratic functions. Examples of these are shown below.
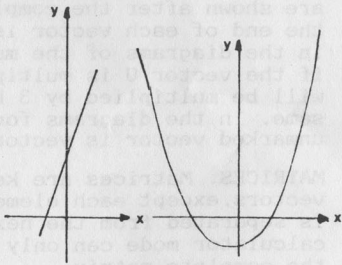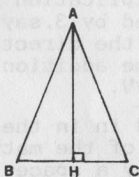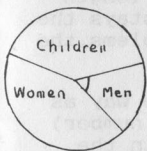
| Pie Chart | Isosceles triangle | Graph of $Y=2X+1$ | Graph of $Y=X^2+X-6$ |

SIMULTANEOUS EQUATIONS. In these problems capital X represents the letter X, while 'x' represents the multiplication sign. The value of X and Y for each problem must be keyed in, in turn, separated by one space.

INDICES IN ALGEBRA. This covers negative, zero and fractional indices. The answers to the problems on zero and fractional indices are numbers while the answers to the problems on negative indices must always be expressed in terms of Y.

INDICES IN ARITHMETIC. Expressions using indices are multiplied, divided or raised to two powers.

VECTORS. To key in a vector, first key in a left-hand bracket, this is immediately followed by a number and a right-hand bracket, then press Return. Now key in the second row of the vector in the same way followed by Return. The calculator mode may only be entered before keying in the complete vector, not half-way through.

Vectors are values which have both size and direction, such as velocity (speed in a particular direction). Diagrams of the vectors of the problem are shown after the complete explanation. In these the end of each vector is labelled. It can be seen in the diagrams of the multiplication problems that if the vector U is multiplied by 3, say, its length will be multiplied by 3 but the directiom stays the same. In the diagrams for the addition problems, the unmarked vector is vector U+V.

MATRICES. Matrices are keyed in in the same way as vectors, except each element of the matrix (number) is separated from the next by a space. Again the calculator mode can only be entered before keying in the complete matrix.

DIFFERENTIAL CALCULUS. Two types of expressions are required to be differentiated, expressions of the type 2X↑3 and quadratic equations.