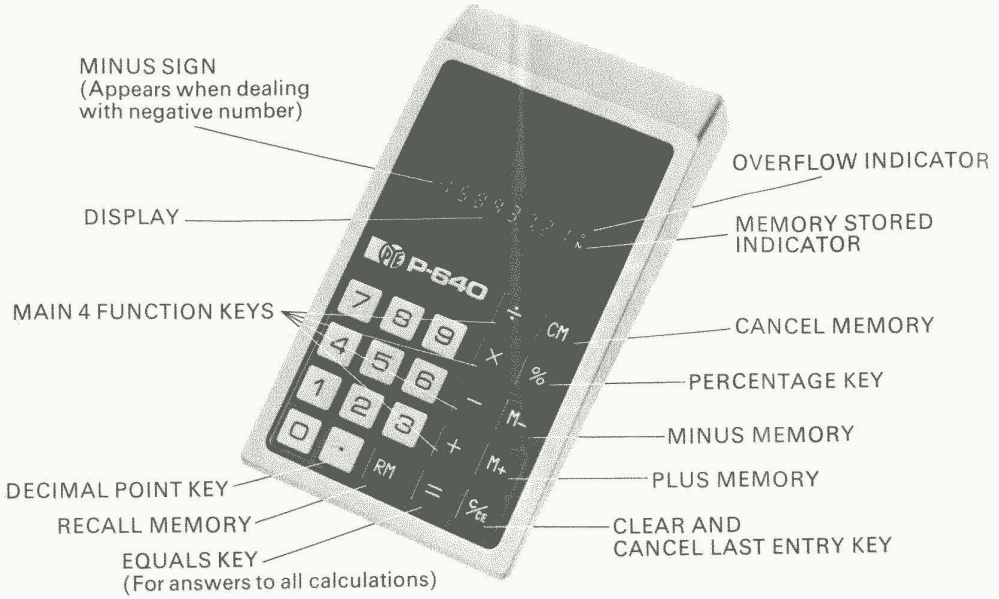
PYE LIMITED, P.O. BOX 49, ST. ANDREWS ROAD, CAMBRIDGE, CB4 1DS

PYE P-640 CALCULATOR

INSTRUCTION BOOK

PYE P-640 CALCULATOR

WITH MEMORY AND % KEY.
BATTERIES AND RECHARGER



Contents

	Page
1. Introducing your Advanced Pye P-640	2
2 Summary of Features	4
3. Long Life Rechargeable Batteries	8
4. Recharging Instructions	9
5. Operation Recommendations	9
6. Controls	10
7. Examples and Problems	13
I. Guide to basic calculations	
(a) Addition	14
(b) Subtraction	14
(c) Multiplication	14
(d) Division	15
(e) Chain multiplication and division	15
(f) Mixed calculations	15
(g) Rounding-up	16
II. Applied examples of basic calculations	17
III. Clear last entry	18
IV. Automatic constant	19
(a) Repeated addition	19
(b) Repeated subtraction	19
(c) Multiplication by constant	20
(d) Division by constant	21
(e) Raising to a 'power'	22
(f) Using constant to calculate compound interests	24
V Percentage Function	25
VI Memory operation	26
VII. Machine capacity – overflow situation	31
8. Guarantee	33
9. Glossary	34

Introducing your advanced Pye P-640

When we set out to design the Pye P-640 calculator, we started with two big advantages. Our research had shown that many of the hundreds of 'pocket' calculators which have flooded the market over the last few years had positive *dis*advantages when it came to actually using them. And, we had our own personal Pye approach, which very simply means we look after the little things to build you better things. In this case a more sophisticated and snag-free calculator than it was possible to buy before.

We noticed that miniaturisation had often been carried to extreme, like making the operating buttons of some other calculators pin-sized. Presumably for people with pin-sized fingers So we made our Pye P-640 operating keys a sensible 'type-writer key' size. Some other 'pocket' calculators lie flat, so they are difficult to use on a desk without having to keep picking them up in order to read and operate. We've given our Pye P-640 an *angled* display and operating surface, so you can place it to one side and still be able to use it easily.

We made the 8-digit readout three times the size of many 'pocket' calculators so it's easy to read and easier on your eyes, even in strong sunlight. We built in a Floating Decimal Point Feature because we knew you wouldn't want to find compounded errors creeping in on long continuous calculations, as they do on calculators with a Fixed Decimal Point. There's an automatic 'constant' function to save you time on repeated calculations, a seperate percentage key, and a memory for storing intermediate totals which you can recall to the display as required. And of course you'll save a lot of money with the Pye P-640's re-chargeable batteries. Up to (£50.00) a year in fact.

All this thoughtful attention to detail means that your Pye P-640 is not merely an executive toy, but a highly sophisticated portable calculator. As you'll discover when you explore its wide range. It has dozens of advanced features and all the little things we've thought of and included.

We know you'll be delighted you chose to own a Pye P-640. As much as we were at Pye, when we achieved the final design.

Summary of features

Here are some of the features of your Pye P-640. Those which need further explanation, or examples for complete clarity, are marked with a page number, where they are dealt with in more detail later in this booklet.

1. Ease of operation

You can operate your Pye P-640 in the same straightforward way you think or write your problems. It is not necessary to learn a special 'calculator language' or method of presenting problems to the Pye P-640. This simplified method of operation means that unlike some other calculators you can work with your Pye P-640 without, at the same time, having to think about *how* to operate it. This means that you will be able to work faster and with greater accuracy. Speed of operation is after all, the whole reason for owning a calculator, and more especially, the Pye P-640.

2. Sensible size keyboard

The 'typewriter size' operating keys of your Pye P-640 are large enough for easy, fumble-free working. Also, in order to simplify operation even more, the figure keys are clearly identified in white from the function keys, which are in black. The keyboard layout too, has been planned very carefully by Pye for ease of operation.

3. Extra large display

Pye have designed the eight figure display in green to be three times the size of some other calculators.

Even strong sunlight will not overcome the clarity of the Pye P-640's display. And the large, clear green figures will be easier on your eyes than the tiny readouts of other calculators.

4. Ideal size

Pye designed the Pye P-640 to be the ideal weight and size for easy handling as well as being an easily portable size. Pye research and study of other calculators has shown that over-miniaturisation can cause mistakes. (Operating tiny buttons for instance over a long period can become tiring and irritating). Also, the keyboard, display surface of the Pye P-640 is angled to be easier to operate and read on a desk than other 'pocket' calculators.

5. Ability to mix calculations

Enables you to do a lengthy calculation involving a mixture of any of the four functions, i.e. addition, subtraction, multiplication and division without having to press a key to display intermediate answers.

6. Fully-addressable memory

Your calculator has a separate memory bank which enables you to "save" numbers or intermediary answers for subsequent manipulations : the memory can be added to or subtracted from. (see page 26)

7. Automatic constant

Is available on all four functions, enabling manipulation of a series of numbers by a constant without need to

Long-life rechargeable batteries

Your Pye P-640 calculator contains long-life rechargeable nickel-cadmium batteries. When fully charged, they will operate your calculator for four to five hours of continual use. When they are about to run out the display will dim. It does your batteries no harm to remain constantly partly charged, but we recommend you keep them regularly topped up in case you go on a trip or become involved in long periods of constant calculations, when your charger might be elsewhere. The batteries will last you through several years of regular daily use. Do not worry about *over*charging them. It is impossible. When you finally need them, replacements for your rechargeable batteries can be obtained through your Pye dealer. In an emergency you can fit ordinary "disposable" batteries. Please note they will not take a re-charge.

Charge before operating for the first time

Trade storage regulations do not allow us to fully charge the special batteries at the factory. Therefore it is important to charge them fully yourself before you use your calculator for the first time – about six hours is sufficient.

Recharging Instructions

Attach the charger to a normal 240 Volt AC outlet. Turn on-off-ch switch to 'CH' position. From 'flat' to 'fully charged' will take approximately 8 hours. Your charger will also function as a mains adaptor so you can operate your calculator off the mains, whilst at your desk, with no risk of damage to the batteries. They will be charging, at the same time, but at a slower rate. And of course it is impossible to overcharge them. If you are taking your Pye P-640 to another country with a different mains electric voltage and plug design, remember to ask your Pye dealers advice about an adaptor unit.

Warning: Never use any other charger than the one we supply, otherwise damage may occur.

Operation recommendations

We recommend that you adopt two basic and important practices :

1. Always check each entry on your calculator's visual display, to make sure you have made your entry correctly.
2. When working from written material, always check off your entries as you make them to ensure you do not accidentally repeat them or leave any out. (Even the most experienced calculator operators have been known to make this simple error).

Controls

1. On/Off/CH Switch

ON clears machine completely ; both display and memory register. CH indicates the position for recharging when the machine is not in use.

2. Number Entry Key

Pressing any number key (0 to 9) will enter that number and cause it to appear on the display. To enter 350, press 3 then 5 then 0.

3. Decimal Point Entry Key

Depression of [·] Key correctly places decimal point in your entries. To enter number 350.62 press : 3 5 0 then [·] then 6 2. Again when handling money ; £33.56p is entered as 3 3 then [·] then 5 6

4. Arithmetic Function Keys

[+] **Add,** [—] **Subtract,** [×] **Multiply,** [÷] **Divide.** Pressing any one of these four keys tells the machine what operation to perform with the next number entered, i.e. if you press [—] the next entry will be **subtracted** from the subtotal. During calculations intermediate results are also displayed when these keys are depressed.

5. [=] [%] **Keys**

[=] EQUALS [%] PERCENTAGE : when equals [=] key is depressed, the answer will appear on the display. Depression of percentage [%] key will give you the answer as a percentage.

Example :

12% of 40. Depress [C/CE] 12 [×] 40 [%]

Answer 4.8

For examples of operations where [%] and [=] keys are depressed see examples of calculations on later pages.

In both cases, the decimal point will be automatically positioned in the correct place. An answer can be retained as the first number of the next calculation. At the conclusion of a calculation depressing the equals [=] or percentage [%] keys will provide the answer to the problem. It is not necessary to clear the machine to carry on with subsequent calculations.

6. Multiple Function of Clear Entry Key

A calculation is of course always completed by depressing the [=] or [%] key. The [C/CE] key can be used in three ways. (1) At the end of a calculation the [C/CE] key will be used in the normal fashion with one depression i.e. to clear the display. (2) In the middle of a calculation depression of the key will clear the last-entry only. (3) If it is required to clear a totally abortive calculation, *before* the [=] or [%] are depressed, then 2 depressions of the [C/CE] key will clear the entire calculation.

7. Memory Operation Keys

[M +] When this key is depressed, displayed number is added to the number in memory.

[M —] When this key is depressed, displayed number is subrtacted from the number in memory.

[RM] (Recall Memory) Depress this key to display the number stored in memory. Even when recalled for display, number will remain in memory until cleared by [CM] Key (Cancel Memory).

A recalled figure is immediately addressable for further calculation ; To clear memory depress the CM Key. (See page 26).

8. Memory Signal

This signal M appears to the right of the display as long as there is a figure in the memory register.

9. Automatic Constant

Your Pye calculator automatically retains the first entry in a multiplication problem (the multiplier) as a constant. In a division problem the second entry (the divisor) is also retained as a constant. With calculations involving addition and subtraction a number can be repeatedly added or subtracted by depressing the respective function key the desired number of times. (See page 19).

10. Machine Capacity/Overflow Signal

0 This signal appears, to the right of the display, when the answer to a calculation exceeds the capacity of the display screen i.e. 8 digits. The keyboard will lock in such an overflow condition. Depress the C/CE key ONCE to clear the the overflow condition without losing the 8 most significant digits on the display. In an overflow condition a decimal point will appear in such a position in the display that the true position of the decimal point is 8 places to the right of its position in display. (See page 31).

Examples and problems

To enable you to get the very best out of your Pye calculator, we have designed the following sequence of examples and problems to familiarise you with all its operations and capabilities.

We strongly recommend that you do read this example/problem section since a haphazard attempt at operation can lead to difficulties. Also please take the time to actually work through the sample calculations because Pye research into calculator operation has shown that 'imprinting' the actual method of physical operation on yourself is a better aid to memory than merely reading about it.

Guide to Basic Calculations

Example	You Enter		Display Shows
Addition			
3 + 7 + 5 = 15	c/ce	3 +	3.
		7 +	10.
		5 =	15.
4.36 + 6.29 + 3 = 13.65	c/ce	4.36 +	4.36
		6.29 +	10.65
		3 =	13.65
Subtraction			
7.1 — 1.3 — 3 = 2.8	c/ce	7.1 −	7.1
		1.3 −	5.8
		3 =	2.8
Multiplication			
1.5 × 3 × 6.25 = 28.125	c/ce	1.5 ×	1.5
		3 ×	4.5
		6.25 =	28.125

Example	You Enter		Display Shows
Division			
36 ÷ 6.7 ÷ 1.1 = 4.8846675	c/ce	36 ÷	36.
		6.7 ÷	5.3731343
		1.1 =	4.8846675
Chain Multiplication and Division			
16.25 × 3 ÷ 2.25 × 1.2 = 25.999999	c/ce	16.25 ×	16.25
		3 ÷	48.75
		2.25 ×	21.666666
		1.2 =	25.999999
Mixed Calculations			
5.53 + 2.63 — 1.01 ÷ 4.15 = 1.7228915	c/ce	5.53 +	5.53
		2.63 −	8.16
		1.01 ÷	7.15
		4.15 =	1.7228915

Example	You Enter	Display Shows
$\frac{(5.53 - 1.62)\ 2 - 3.5}{12.1} = 0.3570247$		
	c/ce	0.
	5.53 −	5.53
	1.62 ×	3.91
	2 −	7.82
	3.5 ÷	4.32
	12.1 =	0.3570247

Rounding-up

In certain calculations of course you may not be interested in an answer to several places of decimals, e.g. in monetary calculations where you are concerned only with two decimal places, that is in number of pence. In such instances, one 'rounds-up' the third decimal figure : if it is 5 or more, add 1 to the second decimal figure, if it is less than 5, ignore it and the second decimal figure stays as it is.

Thus 25.695312 becomes 25.70 ; £13,371213 becomes £13.37 ; 10.367152 becomes 10.37 ; and 9.9999999 becomes 10.00

Applied Examples of Basic Calculations

Problem 1 You want to Balance your Current Bank Account

		You Enter		Display Shows	
Balance Brought Forward	£49.36	c/ce	49.36	49.36	Balance Remaining
		−		49.36	
Cheque Paid Out	£10.25		10.25	10.25	
		−		39.11	Balance Remaining
Cheque Paid Out	£12.00		12	12	
		+		27.11	Balance Remaining
Deposit Paid In	£140.00		140	140	
		−		167.11	Balance Remaining
Cheque Paid Out	£56.00		56	56	
		−		111.11	Balance Remaining
Cheque Paid Out	£25.00		25	25	
Balance		=		86.11	Balance Remaining

Clear Last Entry

Corrects wrong number entry, without affecting previous entries in a long calculation, this enables you to erase an incorrect number without erasing calculaton to that point.

Example 1	You Enter	Display Shows
16+4.25+13.53=33.78	16 [+]	16.
In error 4.55 is entered.		
Incorrect entry	4.55→[c/ce] PRESS ONCE	16.
	4.25 [+]	20.25
	13.53 [=]	33.78

Procedure is to press [c/ce] once and re-enter corrected number.

Automatic Constant

Repeated Addition

Auto Constant enables you to make repeated addition of a number without re-entry. Having once entered constant number to be added ; calculation is made by press [+] function appropriate subsequent number of times.

Example	You Enter	Display Shows
5 + 4 + 4 + 4 = 17	5[+]4[+][+][=]	17.
Repeated Subtraction		
8 − 3 − 3 − 3 − 3 = −4	8[−]3[−][−][−][=]	−4.

Multiplication by Constant

Your calculator automatically retains the first entry in a multiplication problem (the multiplier) as a constant ; there is therefore no need for re-entry.

Example 1	You Enter	Display Shows
12.25 × 3 = 36.75	12.25 [×] 3 [=]	36.75
12.25 × 5 = 61.25	5 [=]	61.25
12.25 × 9 = 110.25	9 [=]	110.25

I wish to convert £ sterling prices to US Dollar equivalent : exchange rate taken as U.S. $2.4 = £1.

£5 × 2.4 = $12	2.4 [×] 5 [=]	12. Dollar Equivalent
£200 × 2.4 = $480	200 [=]	480. Dollar Equivalent
£23.50 × 2.4 = $56.4	23.5 [=]	56.4 Dollar Equivalent

Division by a Constant

Your calculator automatically retains the second entry in a division problem (the divisor) as a constant.

Example 1	You Enter	Display Shows
145 ÷ 12 = 12.083333	145 [÷] 12 [=]	12.083333
149 ÷ 12 = 12.416666	149 [=]	12.416666
369 ÷ 12 = 30.75	369 [=]	30.75

Example 2

I wish to convert $ US value prices to £ sterling equivalent : exchange rate taken as US $2.4 = £1

$120.6 ÷ 2.4 = £50.25	120.6 [÷] 2.4 [=]	50.25 Sterling Equivalent
$34.32 ÷ 2.4 = £14.30	34.32 [=]	14.3 Sterling Equivalent
$39.60 ÷ 2.4 = £16.50	39.6 [=]	16.5 Sterling Equivalent

Raising to a power

Your Pye calculator uses auto constant facility to calculate "powers".

Example 1	You Enter	Display Shows	
$10.025^2 = 100.50062$	c/ce 10.025 ×	10.025	i.e. 10.025^1
	=	100.50062	i.e. 10.025^2

Example 2

$12^4 = 20736$	c/ce 12 ×	12.	i.e. 12^1
	=	144.	i.e. 12^2
	=	1728.	i.e. 12^3
	=	20736.	i.e. 12^4
	c/ce	0.	

In such cases with a positive power the equals key should be depressed one *less* time than number of the power.

Example 3	You Enter	Display Shows	
$2^{-3} = 0.125$	c/ce 2 ÷	2.	
	=	1.	i.e. 2^0
	=	0.5	i.e. 2^{-1}
	=	0.25	i.e. 2^{-2}
	=	0.125	i.e. 2^{-3}

In such cases with a negative power the equals key should be depressed one *more* time than number of the power.

Using Constant to Calculate Compound Interest

Example 1	You Enter	Display Shows
I invest £500 at annual interest rate of 8½%, what will my investment be worth after 6 years	c/ce 1.085 × = = = = = × 500 =	1.6314673 815.73365

Example 2

Had I wished to calculate compound rate in Example 1 over 20 years. $1.085^{20} = (1.085^{5})^{4}$	c/ce 1.085 × = = = = × = = = × 500 =	1.5036565 5.1120432 2556.0216

Answer £2,556.02

Again had it been 15 years : $1.085^{15} = (1.085^{5})^{3}$	c/ce 1.085 × = = = = × = = × 500 =	1.5036565 3.3997414 1699.8707

Percentage Function

The percentage % key function on your Pye calculator facilitates :

a) Calculating percentage of a number	You Enter	Display Shows
6% of 180 = 10.8	180 × 6%	10.8
b) Calculating ratio of numbers as a percentage What % of 48 is 6 ? 6 ÷ 48 = 12.5%	6 ÷ 48%	12.5
c) Calculating automatic mark-up A custom's duty mark-up of; 10.1% must be applied to an imported product costing £12.25. £12,25 + 10.1% = £13.49	12.25 + 10.1% =	13.48725
d) Calculating automatic discount A purchaser is to buy at 41% off a R.R.P. of £35 £35 − 41% = £20.65	35 − 41% =	20.65

The mark-up and discount procedures are in an as-you-think logic
i.e. x + y% = ; x − y% =
Also it will be noted that the intermediate % figure is shown.

Memory Operation

The invaluable nature of the addressable memory is best explained in terms of the following problems :

Problem 1	You Enter	Display Shows

I wish to determine the total value of a company's sales in the home market. I know the unit selling price of each of its three products, and total unit sales for each product : these unit sales however embrace both home and export markets. Again, however, I know the combined value of all export sales. What is the value of total sales on the home market ?

Product A :		
£4.50 × 500 total unit sales	45.50 [×] 500 [=]	22750. total Product A
	[M+]	22750.M total Product A
Product B :		
£55.50 × 400 total unit sales	55.50 [×] 400 [=]	22200.M total Product B
	[M+]	22200.M total Product B
Product C :		
£60 × 250 total unit sales	60 [×] 250 [=]	15000.M total Product C
	[M+]	15000.M total Product C
Total Export Sales : £10,225	10225 [M−]	10225.M total export
	[RM]	49725.M total home sales
	[CM]	49725. value
	[c/ce]	0.

Answer : **49725** : Home market sales value : **£49,725**

Problem 2	You Enter	Display Shows
$\frac{1234}{(2+3)\times 7\div 3.5} = 123.4$	c/ce	2.
	2 +	5.
	3 ×	35.
	7 ÷	10.
	3.5 =	10.M
	M+	1234.M
	1234 ÷	123.4M
	=	123.4
	RM	0.
	CM	
	c/ce	

Problem 3

I pay an overseas supplier a basic unit price of £12 for a product : on top of this I must pay freight/insurance costs of 7% on this basic cost. Import duty is chargeable at a rate of 10.1% on the total landed cost. I believe I can get a selling price of £19.50 for this product. What is my gross profit margin on this selling price ?

$$\frac{£19.50-(£12+7\%+10.1\%)}{19.50} \times 100\ \%$$

You Enter	Display Shows	
c/ce 12 +	12.	basic unit cost
7 % =	12.84	cost + freight + insurance
+ 10.1 % =	14.13684	cost + freight, insurance + import duty
M+	14.13684M	cost + freight, insurance + import duty
19.5 −	19.5M	selling price
RM	14.13684M	cost + freight, insurance + duty
=	5.36316M	gross profit
÷ 19.5 %	27.503384M	percentage gross margin
CM	27.503384	
c/ce	0.	

Answer : **27.50**% (rounded) Gross Profit Margin

Problem 4

(Using memory in simple accumulator fashion)

I wish to work out cost of covering floors of a house : room 1 : 18m × 12m ; room 2 : 7.5m × 14m, room 3 : 3.10m × 12.25m. Cost of floor covering £0.26 per sq. metre. What is the total cost ?

You Enter	Display Shows	
c/ce 18 × 12 =	216.	area room 1
M +	216.M	area room 1
7.5 × 14 =	105.M	area room 2
M +	105.M	area room 2
10 × 12.25 =	122.5M	area room 3
M +	122.5M	area room 3
RM ×	443.5M	total area of
0.26 =	115.31M	rooms 1, 2 and3
CM	115.31	total cost of
c/ce	0.	floor covering

Total cost **£115.31**

Machine Capacity

Overflow Situation

In cases where an answer obtained exceeds the display capacity of the machine, the overflow signal (°) will appear on the extreme right of the display. Your Pye calculator enables you to determine the true size of the answer i.e. how many additional noughts are to added to the most significant figures displayed. In an overflow condition— ° sign illuminated—a decimal point will appear in such a position in the 8 figures displayed that the true position of the decimal point is EIGHT PLACES TO THE RIGHT OF ITS POSITION IN THE DISPLAY. Thus if the display shows 50 °. actual position of decimal is eight places to right = 50. + 00000000 = 5,000,000,000.

The keyboard will lock in an overflow situation : depressing the c/ce key ONCE will clear the overflow condition (° sign disappears) without losing the figures in the display. This can then be cleared, or a calculation, proceed on the figures displayed.

Example 1	You Enter	Display Shows	
98,000,000 × 2000 = 196,000,000,000	98000000 [×] 2000 [=]	1960°	Overflow sign

Answer 1960.°: overflow sign indicates true size is with decimal point 8 places to right of position indicated in display.

Answer therefore **196,000,000,000**

Example 2	You Enter	Display Shows	
98,000,000 × 1000 × 0.05	98000000 [×] 1000 [=]	980°	Overflow sign
	[c/ce]	980.	Overflow sign disappears
	[×] .05 [=]	49.	

Answer therefore : 49. + 8 places of decimals

4,900,000,000

Guarantee

Pye market their calculators and charger/adaptors on the understanding that should any defect in manufacture or material appear in them within one year from acquisition by the consumer, the dealer from whom the calculator was obtained will arrange for a replacement, with the same model, or similar model if stocks of the original are no longer available provided :

1. reasonable evidence is presented proving date of acquisition within one year prior to date of claim.
2. the defect is not the outcome of misuse, accidental damage, inexpert repair, or use contrary to the Pye operating instructions.

In the event of any defect therefore, your calculator should be returned in first instance to the dealer from whom it was purchased. The calculator must be returned with all the accessories i.e. battery, case, charger/adapter. On making any claim for a replacement calculator you should give the dealer the following information :

Calculators serial number .....

Date of Purchase.....

Place of Purchase .....

The dealer should complete this at time of purchase

Note:
This guarantee does not affect your rights against the dealer from which the calculator was bought if it is faulty.

Glossary

Constant – the fixed number used in successive calculations.

Divisor – the number by which the second number is divided.

Functions – one of the four basic operations your calculator performs, i.e. adding, substracting, multiplying, dividing.

Memory – a place where a number is stored and where additional numbers may be added to or subtracted from. The stored number can be recalled for use in further calculations and yet still be retained until you clear the memory.

Multiplier – the number by which the second number is multiplied.

Negative Number – any number with a minus sign before it.

Power – the power of a figure is the number of times that figure is multiplied by itself e.g. $2 \times 2 \times 2 \times 2$ is expressed 2^4

Negative Power – e.g. 2^{-2}

Overflow – a condition which occurs when the result of a calculation exceeds the 8 digits of the display.

Round-up – the method of approximation which reduces the numbers to the right of the decimal point.