hp calculators

HP 17bII+ Chain Calculations

Algebraic Mode

Reverse Polish Notation Mode

Chain calculations, also called series calculations, are those calculations where you are performing successive arithmetic operations in a "chain" or "series." Your financial calculator can efficiently perform these operations in either the Algebraic or Reverse Polish Notation mode.

ALGEBRAIC:

The Algebraic system uses parentheses the way you would write out an arithmetic operation. For example, say you wanted to multiply the sum of 10 and 20 by 5. You would write this: 5(10 + 20). Below are the keystrokes for this operation and also what your display (set to two places to the right of the decimal) will show as you perform each step:

Keystrokes	Display
5	5
x	5.00x
(	5.00x(
10	5.00x(10
+	5.00x(10.00+
20	5.00x(10.00+20
)	5.00x30.00
=	150.00

At the point when you have closed the parentheses the calculator performs the arithmetic operation inside the parentheses. Instead of closing the parentheses, you have the option of just hitting the equal sign and that will both perform the operation inside the parentheses (10 + 20) and outside (5x).

REVERSE POLISH NOTATION:

In the RPN mode we will work the problem we did above using the Algebraic system, the 5(10+20). It is generally easier (less keystrokes) when using the RPN mode for solving a problem of this type to work inside the parentheses first. That is, we will add the '10' and '20' before we multiply by the '5.' The keystrokes and the display (set two places to the right of the decimal) on each step are:

Keystrokes	Display
10	10
ENTER	10.00
20	20
+	30.00
5	5
x	150.00

The ability to perform chain calculations is an immense advantage in the use of the HP 17bII+. Let's try the slightly more involved problem shown below, to ensure you feel comfortable in working these calculations:

$$\frac{18 + 12(240 - 3)}{75}$$

ALGEBRAIC:

Keystrokes	Display
18	18
+	18.00+
(	18.00+(

The open parentheses is inserted here because '18' is going to be added to the result of the rest of the arithmetic operation in the numerator. That is, before we can add '18' we have to get the result of '12' times the result of '240' minus '3.'

12	18.00+(12
x	18.00+(12.00x
(	18.00+(12.00x(

The additional open parentheses is necessary here because you have to calculate what is inside the parentheses of the problem - the '240' minus '3' - before you multiply by the '12.'

240	18.00+(12.00x(240
-	18.00+(12.00x(240.00-
3	... .00(12.00x(240.00-3
)	18.00+(12.00x237.00

The closing of the second open parentheses (the one to the right) calculates what is inside of that parentheses, '237,' the result of subtracting '3' from '240.'

)	18.00+2,844.00

The closing of the first open parentheses (the one to the left) calculates the result of '12' times '237.'

÷	2,862.00÷

Hitting an arithmetic operator, in this case the division key, completed the pending addition in the numerator and indicated the result in the display before showing the division sign.

75	2,862.00÷75
=	38.16

Note that if you started the above problem by working inside of the parentheses you could solve the problem with less keystrokes:

Keystrokes	Display
240	240
-	240.00-
3	240.00-3
x	237.00x

As shown in the previous calculation, when an arithmetic operation is pending and not shielded by parentheses, the calculator will complete that pending operation if you key in a subsequent arithmetic operator. So, in the above we had "240 - 3" pending when we keyed in the subsequent "x," which caused the calculator to perform the subtraction as the "x" was brought in.

12	237.00x12
+	2,844.00+
18	2,844.00+18
÷	2,862.00÷
75	2,862.00÷75
=	38.16

REVERSE POLISH NOTATION:

As was demonstrated in the Algebraic mode, it is usually easier (less keystrokes) in working a problem like this to begin with the arithmetic operations inside the parentheses first. We do that in the keystrokes shown below to solve this problem:

Keystrokes	Display
240	240
ENTER	240.00
3	3
-	237.00
12	12
x	2,844.00
18	18
+	2,862.00
75	75
÷	38.16