SOME SERIOUS SERIES SUMS

What is the SUM of the numbers 1 to 10 ?

To find the sum, you probably just added up the numbers. But what if you wanted to find the sum of the numbers 1 to 100 ? That would take a long time, even using a calculator. Can you find a shortcut way of doing it?

If you get really stuck you can look at “Some serious solutions” – part A

Can you explain what you have done?

Can you write it as a formula?

$$T=n(n+1)/2$$

Now find the sum of the numbers 1 to 50 ?
Be careful – it is NOT just HALF the sum of 1 to 100. (perhaps you could explain why it isn't.)

Now find the SUM of the numbers 1 to 79
You can use your formula if you have managed to discover one.

If you get really stuck you can look at “Some serious solutions” – part B

SOME SERIOUS SOLUTIONS

Part A

Write the numbers 1 to 100 in a row (… well, some of them anyway.)

1 2 3 4 5 - - - - - - - - - - - - - - 96 97 98 99 100

Now write them underneath in reverse (… well, some of them anyway.)

1 2 3 4 5 - - - - - - - - - - - - - - 96 97 98 99 100
100 99 98 97 96 - - - - - - - - - - - - - 5 4 3 2 1

Remember, we've now got TWO lots of the numbers 1 to 100
Now add them up.

1 2 3 4 5 - - - - - - - - - - - - - - 96 97 98 99 100
100 99 98 97 96 - - - - - - - - - - - - - 5 4 3 2 1
101 101 101 101 101 - - - - - - - - - - - - - 101 101 101 101 101

So, how many 101's are there? (including the ones we couldn't be bothered to write down!) – and what do they all add up to? BUT - remember that this is TWO lots of the numbers 1 to 100 – so we need to HALVE this.

Easy, really.

Part B

Clue:

1 2 3 4 5 - - - - - - - - - - - - - - 75 76 77 78 79
79 78 77 76 75 - - - - - - - - - - - - - 5 4 3 2 1
80 80 80 ……etc.

79 lots of 80

Then halve the total.

SOME SERIOUS SERIES SUMS - 2

Suppose you wanted to find the sum of the numbers 7 to 57

Show your working-out here.

Write a brief explanation of the steps you have taken to get the sum.

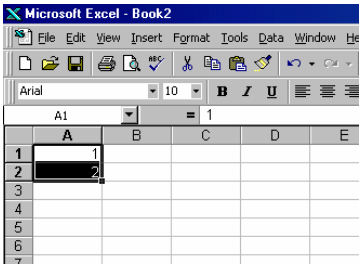
Can you work out the new formula?

Can you think of another way you could get the answer? (The sum of 7 to 57.)

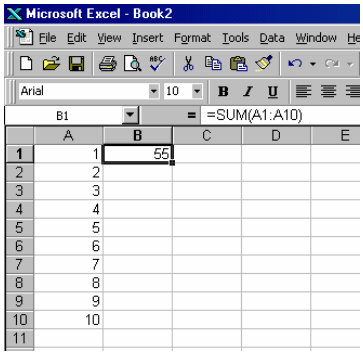
SOME SERIOUS SERIES SUMS - 3

(Spreadsheet stuff)

Open EXCEL
Click on cell A1. Insert the number 1
Click on cell A2 Insert the number 2



Highlight both cells.
Place cursor on little black square (bottom right of cell) and click-drag down to cell A10



You now have numbers 1 to 10 printed downwards in column A.

In cell B1 enter this formula =SUM(A1:A10)

This will show the SUM of the cells A1 to A10

Cell B1 should show the number 55

Use this technique to find the SUM of the numbers 1 to 100

Find the SUM of the numbers 1 to 50

Can you work out how to find the SUM of the numbers 5 to 57

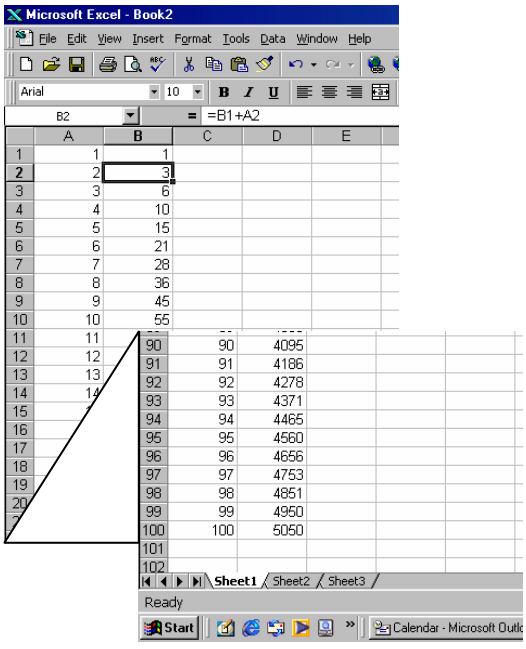
Start a new sheet.

Put numbers 1 to 100 in column A
(Put 1 in A1. Put 2 in A2. Highlight both cells. Drag down to A100)

In cell B1 put the formula =A1
(This will show in cell B1 whatever is in cell A1)

In cell B2 put the formula =B1+A2
(What does this show?)

Highlight cell B2
Drag it down to B100
(What do these numbers represent?)



BRAINBOXX