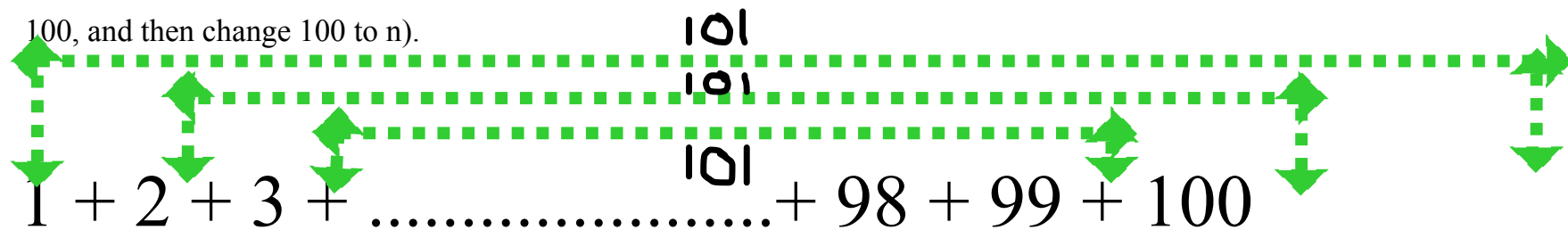


# GAUSSIAN SUM

To add the numbers from 1 to 100, pair up the numbers  $n$  (where  $n$  equals 1) and  $(101-n)$ . If you add  $n + (101-n)$ , you get 101 for the sum. Since there are 100 numbers, there are 50 pairs. Therefore, the sum is  $50(101)=5050$ . Remember that Gauss figured this out in elementary school in a very short time.

What is the formula for the sum of the numbers from 1 to  $n$ ? (HINT: Write 50 and 101 in terms of 100, and then change 100 to  $n$ ).



$$\begin{array}{r} 101 \\ * 50 \\ \hline 5,050 \end{array}$$

ADDING THE NUMBERS 1  
THROUGH 1000

$$\begin{array}{r} 1001 \\ * 500 \\ \hline 500,500 \end{array}$$

ADDING THE NUMBERS 1 THROUGH 1,000,000

$$\begin{array}{r} 1,000,001 \\ * 500,000 \\ \hline 500,000,500,000 \end{array}$$

# ADDING THE EVEN INTEGERS FROM 2 THROUGH 200

$$2 + 4 + 6 + \dots + 196 + 198 + 200$$

202  
202  
202

$$\begin{array}{r} \cancel{0} \\ 202 \\ \times 50 \\ \hline 10,100 \end{array}$$

## ADDING MULTIPLES OF FIVE FROM 5 THROUGH 1000

$$\begin{array}{r} 1005 \\ * 100 \\ \hline 100,500 \end{array}$$

3x3 grid -- add 1-9, then divide by 3

$$[(1 + 8)4 + 9] / 3 = 15$$

4x4 grid -- add 1- 16, then divide by 4

$$[(1 + 16)8] / 4 = 34$$

5x5 grid -- add 1 - 25, then divide by 5

$$[(1 + 24)12 + 25] / 5 = 65$$

7x7 grid -- add 1 - 49, then divide by 7

$$[(1 + 48)24 + 49] / 7 = 175$$

8x8 grid -- add 1-64, then divide by 8

$$[(1 + 64)32] / 8 = 260$$