Navam's Law of Integers

"The product of the sum of x & y and the number of integers in between x & y is twice the sum of the integers in between x & y (where $x < y$ and $x, y \in \mathbb{Z}$)"

Or

$$m (x + y) = 2\,\Sigma n$$

where $m \Rightarrow$ number of integers in between x and y excluded and

$\Sigma n \Rightarrow$ sum of all the integers in between x and y excluded!

Proof:

$\Sigma n = n_1 + n_2 + \ldots + n_m$

We know that, $n_1 = x + 1 \rightarrow a$

$n_2 = y - 1 \rightarrow l$

We also know that, $S_n = \frac{n}{2}(a + l)$

$$\Rightarrow \Sigma n = \frac{m}{2}(x + 1 + y - 1)$$

$$\therefore m (x + y) = 2\,\Sigma n$$

Another Version:

We know that the number of integers in between x & y is one less than the difference of y & x.

$\Rightarrow m = (y - x) - 1$

Navam's Law of Integers $\Rightarrow$ $(y - x - 1)(x + y) = 2\,\Sigma n$

$$(y - x)(y + x) - (x + y) = 2\,\Sigma n$$

$$y^2 - x^2 - (x + y) = 2\,\Sigma n$$

$$\therefore y^2 - x^2 = x + y + 2\,\Sigma n$$