> The first time I found by calculation that the square of a binocular figure was composed of the square of each of its parts, and double the product of one by the other; though convinced that my multiplication was right, I could not be satisfied till I had made and examined the figure: not but I admire algebra when applied to abstract quantities, but when used to demonstrate dimensions, I wished to see the operation, and unless explained by lines, could not rightly comprehend it.

"The Confessions of Jean Jack Rousseau" by Jean Jack Rousseau, 1789.

$$(a+b)^2 = a^2 + b^2 + 2ab \tag{1}$$

$$a^2 = (a+1)(a-1) + 1 \tag{2}$$

$$(a+b)(a-b) = a^2 - b^2 \tag{3}$$

$$T_n = 1 + 2 + \cdots + n = \frac{n(n+1)}{2} \tag{4}$$

$$T_{n-1} + T_n = n^2 \tag{5}$$

$$1^2 + 2^2 + 3^2 + \cdots + n^2 = \frac{n(n-1)(2n-1)}{6} \tag{6}$$

$$n^2 = 1 + 3 + 5 + \cdots + (2n-1) \tag{7}$$

$$\frac{a}{b} < \frac{a+c}{b+d} < \frac{c}{d} \tag{8}$$

$$\sqrt{ab} \le \frac{a+b}{2} \tag{9}$$

$$\sin x + \cos x \le \sqrt{2} \tag{10}$$

$$F_1 = F_2 = 1,\ F_n = F_{n-1} + F_{n-2}; \quad F_1^2 + F_2^2 + \cdots + F_n^2 = F_n\,F_{n+1} \tag{11}$$

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