AM-GM inequality

The *arithmetic mean–geometric mean (AM–GM) inequality* states that for positive real numbers $x_1, x_2, ..., x_n$,

$$\frac{1}{n}\sum_{i=1}^{n} x_i \geq \left(\prod_{i=1}^{n} x_i\right)^{\frac{1}{n}},$$

that is, the arithmetic mean of a set is always greater than or equal to its geometric mean, with equality if and only if all of the x_i are equal.

For example, the case $n = 2$ states that if we have two positive numbers x and y, they satisfy:

$$\frac{x+y}{2} \geq \sqrt{xy}$$

with equality if and only if $x = y$.