Collatz' Conjecture

Suppose that $f : \mathbb{N} \to \mathbb{N}$ is defined as:

$$f(n) := \begin{cases} n/2 & n \in 2\mathbb{N}, \\ 3n+1 & \text{otherwise.} \end{cases}$$

and for each $n \in \mathbb{N}$ let $n_0 := n$ and $n_k := f(n_{k-1})$ for $k = 1, 2, \ldots$, then for all $n \in \mathbb{N}$, there exists a $k \in \mathbb{N}$ such that $n_k = 1$.

Goldbach's Conjecture

Let $k \in \mathbb{N}$, such that $k \geq 2$, and $n = 2k$, then $\exists p, q \in \mathbb{N}$, prime, such that $n = p + q$.

Gauss-Bonnet Theorem

Let $\mathcal{S}$, be a smooth compact surface in $\mathbb{R}^3$ and T be a triangulation on $\mathcal{S}$, then

$$\iint_s k dA = 2\pi\chi(S;T)$$

Taylor's Theorem

Let $f \in C^\infty(\mathbb{R};\mathbb{R})$, then $\exists s \in \mathbb{R}$ such that:

$$f(x) = \sum_{n=0}^{k} \frac{f^{(n)}(0)}{n!} x^n + \frac{f^{(k+1)(s)}}{(k+1)!} x^{k+1}$$

Theorema Egregium

Let $\mathcal{S}_1, \mathcal{S}_2$, be smooth surfaces in $\mathbb{R}^3$, $F : \mathcal{S}_1 \to \mathcal{S}_2$ be a local isometry, and $p \in \mathcal{S}_1$ then $k(p) = k(F(p))$.

Lagrange's Theorem

Suppose G is a finite group, and $H \subseteq G$ a subgroup, then

$$|G| = |G/H|\,|H|$$