What is a Direct Proof?

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If a result is a directly implied by the definitions involved, we call the proof of such a result a *direct proof*. For example:

Claim. If $f(x)$ is a polynomial and $f(0) = 0$, then the constant term of $f(x)$ is zero.

Proof. The definition of a polynomial is any function that looks like:

$$f(x) = a_n x^n + a_{n-1} x^{n-1} + \ldots + a_2 x^2 + a_1 x + a_0$$

where the a_i's are real numbers. In this notation, a_0 is the constant term. If $f(0) = 0$, then:

$$\begin{aligned} f(0) &= a^n(0)^n + \ldots + a_1(0) + a_0 \\ &= a_0. \end{aligned}$$

Therefore, $a_0 = 0$. □