Here is some inline math $f(x) = e^{2x^2}$. Here is a displayed equation,

$$e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$$

Notice that it does not have a label.

Here's some more examples:
The function $\sin x$ can be defined as an infinite series

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \cdots = \sum_{k\geq 0} \frac{x^{2k+1}}{(2k+1)!}. \tag{1}$$

Here is another way to characterize it, using differential equations and initial conditions.

Theorem 0.1. *The function* $\sin x$ *is the* <u>*unique*</u> *solution of the differential equation*

$$\frac{d^2y}{dx^2} + y = 0 \tag{2}$$

satisfying the initial conditions $y(0) = 0$ *and* $y'(0) = 1$.

Notice in the code for this file that the number for the theorem, 0.1, is *not* hard-coded, and that if you need to manually enter parentheses if you want the equation number to appear in text as (2).

There are four references below: [1], [2], and [3].

References

[1] K. Ireland and M. Rosen, "A Classical Introduction to Modern Number Theory," 2nd ed., Springer-Verlag, New York, 1990.

[2] T. J. Kaczynski, Another proof of Wedderburn's theorem, *Amer. Math. Monthly* **71** (1964), 652–653.

[3] P. Roquette, Class field theory in characteristic p, its origin and development, pp. 549–631 in: "Class field theory – its centenary and prospect," Math. Soc. Japan, Tokyo, 2001.