The equation for a straight line is

$$y = mx + b \tag{1}$$

and the equation for a polynomial is

$$\begin{aligned} y &= a_0 + a_1 x + a_2 x^2 + a_3 x^3 + \dots \\ &= \sum_i a_i x^i \end{aligned} \tag{2}$$

Equations 1 and 2 are known to all math students. Notice that

1. Equation 1 is a special case of Eq. 2; and
2. Equation 2 is a Maclaurin series.

Equations 1–2 are used throughout science and engineering.

Equations like

$$y = Ae^{-\gamma t}\cos(2\pi f t)$$

can be left unnumbered if we do not need to refer to them. It is also possible to number equations generically without planning to refer to them; e.g.:

$$\pi = 3.14159265358979323846264 3\dots \tag{3}$$

and

$$e = 2.71828182845904523536028 7\dots \tag{4}$$