show-your-work/compudoc example

C.D. Clark III

May 23, 2025

$$y = mx + b$$

This gives the relationship between a dependent variable y on an independent variable x. For example, for a slope $m = 3$ and y-intercept $b = 2$, the value for y at $x = 10$ would be

$$y = (3)(10) + (2) = 32.0$$

Now, when dealing with physical quantities, we will have to consider units. Take an example from kinematics. The position of an object traveling at constant speed is given by the equation,

$$x = vt + x_0,$$

which is just the equation for a line with v as the slope and $x0$ as the y-intercept. If a car is traveling at $v = 96.560\,64\,\mathrm{km\,h^{-1}}$ and we didn't start the stop watch until we were $137.16\,\mathrm{m}$ out of town, the car's distance from town after traveling for $40\,\mathrm{min}$ would be:

$$x = (96.560\,64\,\mathrm{km\,h^{-1}})(40\,\mathrm{min}) + (137.16\,\mathrm{m}) = 64\,510.920\,000\,000\,006\,\mathrm{m}$$