LaTeX equations are easy to write, and usually self-explanatory. An inline equation starts and ends with a $. Like this: $y = f(x)$.

Display equations need a double $$, like this:

$$y = x^2$$

See if you can find how to do "x is square root of y" as a display equation?

Here it is (thanks Bao!), and here's the more standard way to write display equations:

$$x = \sqrt{y} \tag{1}$$

Another one: summation and subscripts

$$x = \sum_i z_i \tag{2}$$

Try to change that to "x = sum of z from $i = 1$ to n".

$$x = \sum_{i=1}^{n} z_i \tag{3}$$

If your sub/super-script is > 1 characters long, make sure to enclose it with curly brackets. Talking about brackets... here's how they work in an equation

$$x = \left(\sum_{i=1}^{n} z_i \right)^2 \tag{4}$$

Compare to this:

$$x \neq \sum_{i=1}^{n} (z_i)^2 \tag{5}$$

You have to use the "left" and "right" commands, to make the auto-sizing work.

Try to do some of this with an integral on x from ... to ...

$$x \geq \int_0^\infty g(t)dt$$

Now, some Greek and fractions:

$$\bar{x} = \frac{1}{n} \sum_{i=1}^{n} x_i \tag{6}$$

Let's put text *inside* math, like this $x \leq y$ and $x \geq z$.

Where's the Greek? You find it. Write an equation E[x] = mu.

$$E[x] = \mu.$$

Capital Greek, and the probability keyword:

$$\Pr\left(Z \leq z\right) = \Phi(z)$$

...finally, equation arrays:

$$\begin{array}{rcl} y & = & \mathbf{X}\beta + \epsilon \\ \epsilon & \sim & N\left(0, \sigma^2\right) \end{array} \tag{7}$$