Helpful Overleaf Feature. If you ʟᴇꜰᴛ double click at a place in the PDF file, then Overleaf indicates the corresponding place in the LaTeX file, making it easy to compare the PDF output to LaTex input.

Goal: learn how to tag and label an *equation* (or inequality, set containment, etc.) produced using the *equation environment*.

A displayed ⟨i.e. centered⟩ equation is often given a tag ⟨e.g., (17)⟩ so we can refer back to the equation later. Usually, a displayed equation's tag appears in the PDF file on the right side and the tag is a number enclosed with parentheses ⟨e.g., (17)⟩.

The *equation environment* either

    begins with   \begin{equation}   and   ends with   \end{equation},

in which case LaTex automatically creates a tag for the displayed equation, or

    begins with   \begin{equation*}   and   ends with   \end{equation*},

in which case no tag is created.

EQUATIONS WITH AND WITHOUT TAG

Let's display $e^{i\pi} + 1 = 0$. By double clicking, compare the LaTeX input for tagged equation

$$e^{i\pi} + 1 = 0 \tag{1}$$

with the LaTex input for nontagged equation

$$e^{i\pi} + 1 = 0$$

Note the only difference in LaTeX is the two *'s. Let's display another tagged equation

$$\sin \pi = 0. \tag{2}$$

A convenient feature of LaTeX is that LaTeX automatically tags in numerical order.

WHEN TO USE A TAG

The basic rule of thumb is to tag only those equations we want to refer back to later.

LABEL A TAG

Now let's create a *label* for a tagged equation that we want to refer to later. We will refer back to the tagged equation using the *label* we created instead of the number Latex generated.

$$\cos \pi = -1. \tag{3}$$

Now look at the LaTex to see how we can can get the tag number for the above equation to automatically show up: So by (3) we see that $\cos^2 \pi = 1$.

Warning. In your PDF file, if you see (??) or the numbering from *eqref* is off, then recompile your LaTex file one or two more times and the ?? will change to a number and the numbering will correct itself.

ADVANTAGES TO USING A LABEL

One of our Writing Guideline is: *Write a first draft of your proof and then revise it.* In your revisions, you might see that your proof needs reordering. If you rearrange your LaTex file, LaTex will automatically renumber your displayed equations in numerical order. So it is **highly suggested** that you *label* your displayed equations ⟨the *label* will not change upon reordering⟩ and refer back to them using the *eqref*. By using the *label+eqref*, Latex will automatically make the reordering new tag apprear correctly. If you do not use *label+eqref*. then you will go back into you LaTex file and change all the numbering by hand.