Here is a simple example of a proof about subsets:

Claim 1. *The set of integer multiples of 6 between 0 and 8 is a subset of the set of integer multiples of 3 between 0 and 18.*

Proof. We use the definition of subset to show that the set of integer multiples of 6 between 0 and 18 is a subset of the set of integer multiples of 3 between 0 and 18. Letting A be the integer multiples of 6 between 0 and 18, i.e., $A = \{0, 6, 12, 18\}$, and B be the integer multiples of 3 between 0 and 18, i.e., $B = \{0, 3, 6, 9, 12, 15, 18\}$, we see by inspection that every element of A is also an element of B. Therefore $A \subseteq B$ and we have proved that the set of integer multiples of 6 between 0 and 18 is a subset of the set of integer multiples of 3 between 0 and 18. □

And here is a more complicated proof in which you can't just check by inspection:

Claim 2. *The set of all integer multiples of 6 is a subset of the set of all integer multiples of 3.*

Proof. We use the definition of subset to show that the set of integer multiples of 6 is a subset of the set of integer multiples of 3. Suppose a is an integer multiple of 6, i.e., $a = 6n$ for some integer n. Noticing that $6n = 3(2n)$, and that $2n$ is an integer by closure under multiplication, we see that $3(2n)$ is an integer multiple of 3. We have thus shown that any integer multiple of 6 is also an integer multiple of 3, and so the set of integer multiples of 6 is a subset of the set of integer multiples of 3. □