A bad proof

Claim: if \( x \) is positive then \( x + 5 = -x - 5 \).
\[
x + 5 = -x - 5
\]
\[
|x + 5| = |-x - 5|
\]
\[
|x + 5| = |-(x + 5)|
\]
\[
|x + 5| = |x + 5|
\]
\[
0 = 0
\]

This claim is false – if you’re trying to do algebra, you need to start with an equation you know (say \( x = x \) or \( 2 = 2 \) or \( 0 = 0 \)) and expand to the equation you want.

Primes and FTA

Prime

An integer \( p > 1 \) is prime iff its only positive divisors are 1 and \( p \). Otherwise it is “composite”

Fundamental Theorem of Arithmetic

Every positive integer greater than 1 has a unique prime factorization.
Try a few values...

gcd(100,125)  
gcd(17,49)  
gcd(17,34)  
gcd(13,0)

lcm(7,11)  
lcm(6,10)

Greatest Common Divisor

The Greatest Common Divisor of $a$ and $b$ (gcd($a,b$)) is the largest integer $c$ such that $c|a$ and $c|b$.

Least Common Multiple

The Least Common Multiple of $a$ and $b$ (lcm($a,b$)) is the smallest positive integer $c$ such that $a|c$ and $b|c$.

```java
public int Mystery(int m, int n){
    if(m<n){
        int temp = m;
        m=n;
        n=temp;
    }
    while(n != 0) {
        int rem = m % n;
        m=n;
        n=temp;
    }
    return m;
}
```