Important Theorems (et al.)

# Number Theory

## Legendre’s Formula

**Legendre's formula** gives an expression for the exponent of the largest power of a prime *p* that divides the factorial n!

Let vp(n!) = from i = 1 to i = infinity. (n/pi) is integer division

== vp(n!) = where sp(n) denotes sum of standard **base-p** digits of n.

## Kummer’s Theorem

Given integers n >= m >= 0 and prime pi, then the power of p dividing (nCm) is equal to number of **carries** when adding **m** and **n – m** in base **p**.