

Factorial Notes

Factorial:

The Factorial of a number is that number multiplied by every positive integer before it.

Example:

$$3! = (3)(2)(1)$$

$$5! = (5)(4)(3)(2)(1)$$

$$n! = (n)(n-1)(n-2)\dots(3)(2)(1)$$

Dividing Factorials

For positive integers n and m such that $m < n$:

$$\frac{n!}{m!} = \frac{(n)(n-1)(n-2)\dots(m+1)(m)(m-1)\dots(3)(2)(1)}{(m)(m-1)\dots(3)(2)(1)} = \frac{(n)(n-1)(n-2)\dots(m+1)}{1}$$

Example:

$$\frac{5!}{3!} = \frac{5 \times 4 \times 3!}{3!} = 5 \times 4 = 20$$