More on algebra

math612.0 A1: From numbers through algebra to calculus and linear algebra

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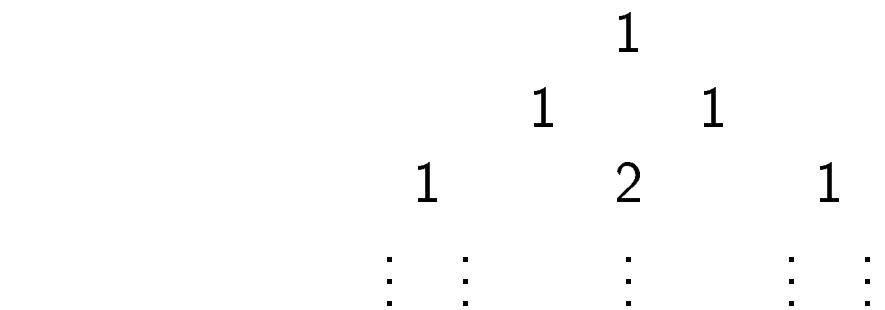
Some Squares

If a and b are real numbers, then

$$(a+b)^2 = a^2 + 2ab + b^2$$

Pascal's Triangle

Pascal's triangle is a geometric arrangement of the binomial coefficients in a triangle



Factorials

We define the factorial of an integer n as
$n! = n \cdot (n-1) \cdot (n-2) \cdot \ldots \cdot 3 \cdot 2 \cdot 1$

Combinations

The number of different ways one can choose a subset of size x from a set of n elements is determined using the following calculation:

$$\binom{n}{x} = \frac{n!}{x!\,(n-x)!}$$

The binomial theorem

$$(a+b)^n = \sum_{x=0}^{n} \binom{n}{x} a^x b^{n-x}$$