Binomial Law

A useful fact to remember is that for (all) numbers a and b we have

[a, b in $\mathbb{Z}, \mathbb{Q}, \mathbb{R}$]

$$(a+b)^2 = a^2 + 2ab + b^2,$$
$$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3,$$
$$(a+b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4.$$

In general, the coëfficients of $(a+b)^n$ are given by the n^{th} row of Pascal's Triangle

1	row 0
1 1	row 1
1 2 1	row 2
1 3 3 1	row 3
1 4 6 4 1	row 4
1 5 10 10 5 1	row 5

Each entry is the sum of the two entries above it, except for the top 1.
[The rows can be extended infinitely in both directions by adding zeroes).