Expansion: multiplying out and collecting/grouping/adding like terms

\[2x + 3y + 3x + 4xy\]
Example 1.17

Expand

1. $2(2x + 1)$
2. $3x(x + 1)$
3. $(x + 1)(2x + 3)$
Example 1.18

1. \((x + y)(2x + 3y)\)
2. \((3x + 2y)(4x - 1)\)
Rules:

We use the distributive property of multiplication over addition. Then collect like terms.
Example 1.19

1. \((x + 4)(x - 4)\)
2. \((2x - 1)(2x + 1)\)
First Binomial Formula

\[(x - a)(x + a) = x^2 - a^2\]
Example 1.20

1. \((x + 4)(x + 4)\)
2. \((2x + 1)(2x + 1)\)
Second Binomial Formula

\[(x + a)(x + a) = (x + a)^2 = x^2 + 2ax + a^2\]
Example 1.21

1. \((x - 4)(x - 4)\)
2. \((2x - 1)(2x - 1)\)
Third Binomial Formula

\[(x - a)(x - a) = (x - a)^2 = x^2 - 2ax + a^2\]
\[(x - a)(x + a) = x^2 - a^2\]
\[(x + a)^2 = x^2 + 2ax + a^2\]
\[(x - a)^2 = x^2 - 2ax + a^2\]

Learn the rules well!
You will need them in new situations.