Guide to:
Expanding and factorising

maths Links

Explanation:

To **expand** a single bracket, multiply the term outside the bracket by **every** term inside the bracket. When expanding and simplifying two separate brackets, be careful with a negative sign in front of the second bracket (e.g. $-2(x - 3) = -2x + 6$).

Factorising is the reverse of expanding: find the **highest common factor (HCF)** of the numbers and the letters, write it outside a bracket, and divide each term by that HCF to find what goes inside. Check by expanding back out.

Example 1: Expand and simplify $\mathbf{4(2x + 3) - 3(x - 5)}$

Solution:

Expand 1st bracket: $4(2x + 3) = \mathbf{8x + 12}$
Expand 2nd bracket: $-3(x - 5) = \mathbf{-3x + 15}$
Collect like terms: $8x - 3x + 12 + 15$
Answer: $\mathbf{5x + 27}$

Example 2: Factorise fully $\mathbf{12x^2y - 18xy^3}$

Solution:

HCF of 12 and 18 is **6**.
Common letters: $\mathbf{xy}$ → full HCF = $\mathbf{6xy}$
Divide each term by $6xy$: $\mathbf{2x}$ and $\mathbf{-3y^2}$
Answer: $\mathbf{6xy(2x - 3y^2)}$

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