Name _____ Date _____

# Grouping and Choosing a Method

Grouping

$ax + ay + bx + by = a(x + y) + b(x + y) = (a + b)(x + y)$

We split the terms into two groups, factor each group, then factor out the common bracket.

**1** ON YOUR OWN Factorise by grouping.

$ax + ay + bx + by =$ ☐

$x^3 + 2x^2 + 3x + 6 =$ ☐

$2a - 2b + ac - bc =$ ☐

$x^2 - xy + 4x - 4y =$ ☐

Flow chart

1. Factor out a common factor.
2. Count the terms:
   - → two terms: difference of squares, difference or sum of cubes
   - → three terms: square of a binomial or $x^2 + bx + c$
   - → four terms: grouping
3. Check whether any factor can be factorised further.

Example:

$2x^3 - 18x = 2x(x^2 - 9)$

$= 2x(x - 3)(x + 3)$

Names (group) _____ Date _____

**2** IN A GROUP **Which method?** For each expression tick the methods you need (there may be more than one), then factorise it.

| Expression | factoring out | difference of squares | square of a binomial | $x^2 + bx + c$ | cubes | grouping | factorised |
|---|---|---|---|---|---|---|---|
| $3a^2 - 12$ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | |
| $x^2 + 10x + 25$ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | |
| $5x^3 - 5x$ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | |
| $a^3 - 8$ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | |
| $x^3 + 2x^2 - 9x - 18$ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | |

**3** ON YOUR OWN Factorise completely.

$x^4 - 16 =$

$2a^3 - 2a =$

$x^3 - x^2 - x + 1 =$

★ ON YOUR OWN **Exit card.** Factorise: $2x^2 - 8 =$