

Factorising by Grouping

Starter

1. (Review of factorising)

Factorise: (a) $8x^2 + 12x$ (b) $15x^2y + 20y$ (c) $y(x + 2) + 7(x + 2)$

Working: (a) $8x^2 + 12x = 4x(2x + 3)$

(b) $15x^2y + 20y = 5y(3x^2 + 4)$

(c) $y(x + 2) + 7(x + 2) = (x + 2)(y + 7)$

N.B. $(x + 2)$ is common to both $y(x + 2)$ and $7(x + 2)$
This is the key step for today's lesson.

E.g. 1 Factorise $ac + ad + bc + bd$.

Working: $ac + ad + bc + bd = a(c + d) + b(c + d)$ *factorise 1st/2nd & 3rd/4th**
 $= (c + d)(a + b)$ *take (c + d) out as a factor*
**Make sure the brackets are the same.*

E.g. 2 Factorise $xy + 5y + 2x + 10$.

Working: $xy + 5y + 2x + 10 = y(x + 5) + 2(x + 5)$ *factorise 1st/2nd & 3rd/4th**
 $= (x + 5)(y + 2)$ *take (x + 5) out as a factor*
**Make sure the brackets are the same.*

E.g. 3 Factorise $2x^2 + 6x + 5x + 15$

Working: $2x^2 + 6x + 5x + 15 = 2x(x + 3) + 5(x + 3)$ *factorise 1st/2nd & 3rd/4th**
 $= (x + 3)(2x + 5)$ *take (x + 3) out as a factor*
**Make sure the brackets are the same.*

E.g. 4 Factorise $3x^2 - 18x + x - 6$

Working: $3x^2 - 18x + x - 6 = 3x(x - 6) + 1(x - 6)$ *factorise 1st/2nd & 3rd/4th**
 $= (x - 6)(3x + 1)$ *take (x - 6) out as a factor*
**Make sure the brackets are the same.*

E.g. 5 What is the problem with factorising $ac + bd + ad + bc$ by grouping?
What can be done about it?

Working: There are no common factors in the 1st/2nd or 3rd/4th terms.
We need to reorder the terms so that each pair has a common factor
Either $ac + ad + bc + bd$ or $ac + bc + ad + bd$

Video: [Factorising by grouping](#)

[Solutions to Starter and E.g.s](#)

Exercise

9-1 class textbook: p112 E4.2 Qu 1-14
A*-G class textbook: p101 E4.2 Qu 1-14
9-1 homework book: p112 E4.2 Qu 1-12
A*-G homework book: p29 E4.2 Qu 1-10

[Homework book answers \(only available during a lockdown\)](#)

