b) Factoring by Grouping

Example: Factor $6ab+3b-4a-2$

There is no common factor among all the terms, but some of the terms do share a common factor.

i) Group the terms that have the same common factor.

$$\underbrace{6ab+3b}_{\text{Group 1}}\underbrace{-4a-2}_{\text{Group 2}}$$

ii) Remove the common factor from each group.

$$3b(2a+1)-2(2a+1)$$

iii) Remove the common factor from both terms

$$(2a+1)(3b-2)$$

Example: Factor $16y^2z - x^2z - 16y^2 + x^2$

$$(z-1)(16y^2 - x^2)$$

*This one can actually be factored further.

Factor

a) $xy - x + 3y - 3$

b) $2a^3b + 3a^3 + 2b^2 + 3b$

c) $ax + ay + az + bx + by + bz$

d) $12a^2 - 6ab - 8ab + 4b^2$