Factoring by Grouping

(ex) $12x^3 - 21x^2 + 28x - 49$

Group terms into 2 groups

$(12x^3 - 21x^2) + (28x - 49)$

Factor out GCF's

$3x^2(4x - 7) + 7(4x - 7)$

Re-write as a product of factors

$\boxed{(3x^2 + 7)(4x - 7)}$

outside · inside

(ex) $8r^3 - 64r^2 + r - 8$

Group

$(8r^3 - 64r^2) + (r - 8)$

Factor out GCF

$8r^2(r - 8) + 1(r - 8)$

Rewrite

$\boxed{(8r^2 + 1)(r - 8)}$

(ex) $12x^3 + 2x^2 - 30x - 5$

Group

$(12x^3 + 2x^2) + (-30x - 5)$

Factor

$2x^2(6x + 1) + -5(6x + 1)$

Rewrite

$\boxed{(2x^2 - 5)(6x + 1)}$