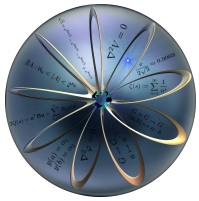

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grouping method for factoring polynomials

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Defines	grouping method

Factoring a given polynomial may in certain special cases by using the following *grouping method*:

1. .

2. Factorize the separately.

3. The whole polynomial may then possibly be written in form of a product.

Examples

a) $x^3 - x^2 - x + 1 = \{x^3 - x^2\} + \{-x + 1\} = x^2(x-1) - 1(x-1) = (x-1)(x^2-1)$
$= (x-1)^2(x+1)$

b) $x^4+3x^3-3x-1 = \{x^4-1\}+\{3x^3-3x\} = (x^2+1)(x^2-1)+3x(x^2-1)$
$= (x^2-1)(x^2+1+3x) = (x-1)(x+1)(x^2+3x+1)$

c) $x^4+4 = \{x^4+4x^2+4\}-4x^2 = (x^2+2)^2-(2x)^2 = (x^2+2+2x)(x^2+2-2x)$
$= (x^2+2x+2)(x^2-2x+2)$

d) $x^4+x^2+1 = \{x^4+2x^2+1\}-x^2 = (x^2+1)^2-x^2 = (x^2+1+x)(x^2+1-x)$
$= (x^2+x+1)(x^2-x+1)$

The trinomials x^2+3x+1, $x^2\pm 2x+2$ and $x^2\pm x+1$ are irreducible polynomials.