

Distributive Property!

Unit 3: Polynomials

3.9 Factoring by Decomposition

When factoring trinomials we always look for the GCF first and fill in our diamond. If we still end up with a leading coefficient that is not 1, we factor by decomposition.

Steps:

- 1) Check for a GCF.
- 2) Set up your diamond and find your magic numbers.
- 3) Replace the middle term with your two magic numbers and x.
- 4) Factor by grouping.

Ex.) Factor the following.

a) $2x^2 + 7x + 6$

$= 2x^2 + 3x + 4x + 6$

$x(2x+3) + 2(2x+3)$

$(2x+3)(x+2)$

b) $5x^2 + 7x + 2$

$= 5x^2 + 2x + 5x + 2$

$x(5x+2) + 1(5x+2)$

$(5x+2)(x+1)$

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Ex.) Factor the following.

c) $12x^2 - 8x + 1$

$12x^2 - 6x - 2x + 1$

$6x(2x-1) - 1(2x-1)$

$(2x-1)(6x-1)$

d) $15k^2 + 5k - 10$

$5(3k^2 + k - 2)$

$= 5(3k^2 + 3k - 2k - 2)$

$= 5[3k(k+1) - 2(k+1)]$

$5(k+1)(3k-2)$