

Algebra I
Factor by Grouping

Name: Key

Date: _____

Factor by Grouping

(**You must have 4 terms to factor by grouping!)

1. $x^3 + 2x^2 + 3x + 6$

(4 terms)

$(x^3 + 2x^2) + (3x + 6)$

(Group terms)

$x^2(x + 2) + 3(x + 2)$ (Factor GCF from each group)

(the parentheses must be the same to continue)

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

(Write final answer)

Check by foil.

2. $x^3 - 2x^2 - 6x + 12$

(4 terms)

$(x^3 - 2x^2) + (-6x + 12)$

(Group terms)

$x^2(x - 2) - 6(x - 2)$ (Factor GCF from each group)

(Write final answer)

$(x - 2)(x^2 - 6)$

Check by foil.

Practice.

1. $(a^2 - 2ab) + (a - 2b)$

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

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

2. $(15xy + 10y) - (3x - 2)$

$5y(3x + 2) - 1(3x - 2)$

$(3x + 2)(5y - 1)$

3. $(14x^2y + 4xy) - (21x - 6)$

$2xy(7x + 2) - 3(7x - 2)$

$(7x + 2)(2xy - 3)$

4. $ac + bd + bc + ad$ Reorder terms

$(a + bc) + (bd + ad)$

$c(a + b) + d(b + a)$

$(a + b)(c + d)$

Classwork! Remember to check by foiling!

1. $(6ab + 4a) + (3b + 2) = 2a(3b + 2) + 1(3b + 2)$

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

2. $(\frac{2x^2}{2x} - \frac{8xz}{2x}) + (\frac{3xy}{3y} - \frac{12yz}{3y}) = 2x(x - 4z) + 3y(x - 4z)$

$(x - 4z)(2x + 3y)$

3. $(x^2 + 2x) + (xy + 2y)$

$x(x + 2) + y(x + 2)$

$(x + 2)(x + y)$

4. $(4k + 12) + (k^2 + 3k)$

$4(k + 3) + k(k + 3)$

$(k + 3)(4 + k)$

5. $(2x^2y + 6xy) - (x - 3)$

$2xy(x + 3) - 1(x + 3)$

$(x + 3)(2xy - 1)$