Algebra 1
7.2 Notes – Factor by Grouping

Name: Key

Date: _____

Example 1: Look for like *groups* and factor them out!

a) $3x(x-3)+5(x-3)$

$(x-3)(3x+5$

b) $9x(x-4)-5(x-4)$

$(x-4)(9x-5)$

c) $2(t^2+1)+3t(t^2+1)$

$(t^2+1)(2+3t)$

d) $-2y(y^2+1)+(y^2+1)$ (one in front)

$(y^2+1)(-2y+1)$

e) $7x(2x+3)+(2x+3)$

$(2x+3)(7x+1)$

f) $5z(5z^2-2)-2(5z^2-2)$

$(5z^2-2)(5z-2)$

Try it!

1. $-3x^2(x+2)+4(x+2)$

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

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

$(x^2-3)(4x+1)$

If there are 4 terms, factor by grouping.

1) Group the first two terms and the second two terms.
2) Factor the GCF from both groups.
3) One factor is the common factor and the other factor is the leftover.

Example 2: Group first, then factor out like groups.

a) $6y^4 - 4y^3 + 12y - 8$

$2y^3 \quad 2y^3 \quad 4 \quad 4$

$2y^3(3y-2)+4(3y-2)$

$(3y-2)(2y^3+4)$

b) $5x^3 - 15x^2 + x - 3$

$5x^2 \quad 5x^2 \quad 1 \quad 1$

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

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

c) $6z^3 + 8z^2 - 9z - 12$

$2z^2 \quad 2z^2 \quad -3 \quad -3$

$2z^2(3z+4)-3(3z+4)$

$(2z^2-3)(3z+4)$

d) $4h^3 + 24h + h^2 + 6$

$4h \quad 4h \quad 1 \quad 1$

$4h(h^2+6)+1(h^2+6)$

$(h^2+6)(4h+1)$

e) $10uv + 35u - 12v - 42$

$5u \quad 5u \quad -6 \quad -6$

$5u(2v+7)-6(2v+7)$

$(2v+7)(5u-6)$

f) $2y^3 - y^2 - 6y + 3$

$y^2 \quad y^2 \quad -3 \quad -3$

$y^2(2y-1)-3(2y-1)$

$(2y-1)(y^2-3)$

Try it!

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

$2x^2 \quad 2x^2 \quad -3 \quad -3$

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

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

2. $v^3 - 2v^2 + 7v - 14$

$v^2 \quad v^2 \quad 7 \quad 7$

$v^2(v-2)+7(v-2)$

$(v^2+7)(v-2)$