

# Grouping

## Steps:

1. Check for GCF@the end.
2. Group with Parentheses  
the first two terms and the last two terms.
3. Factor out the GCF from each group (remember the sign for the second group).
4. Check that "what's Left,"  
is the same for both groups.
5. Set up your two binomials as  
( what's Left ) ( GCF )

Examples:

$$(xy + xz + wy + wz)$$

$$x(y+z) + w(y+z)$$

$$(y+z)(x+w)$$

$$(3a^3 - 9a^2)(+3a - 9)$$
$$(\cancel{3a^2a} - 3\cancel{3aa})(+3a - \underline{3}\cdot 3)$$

$$3a^2(a-3) + 3(a-3)$$

$$(\underline{3}a^2 + \underline{3})(a-3)$$

$$3(a^2+3)(a-3)$$

$$(x^3 - 5x^2 + 9x - 45)$$

$$(\underline{x} \underline{x} \underline{x} - \underline{5} \underline{x} \underline{x}) (\underline{+3} \underline{3} \underline{x} - \underline{3} \underline{3} \underline{5})$$

$$x^2(x-5) + 9(x-5) \checkmark$$

$$(x-5)(x^2+9)$$

$$(5m^2 + 15mp) - 2mr - 6pr$$

$$(\cancel{5m}m + 3\cdot\cancel{5m}p)(\cancel{2}m\cancel{r} - 3\cdot\cancel{2}p\cancel{r})$$

$$5m(m + 3p) - 2r(m + 3p)$$

$$(m + 3p)(5m - 2r)$$

$$y^2 + ab - ay - by$$

GROUPING

$$(y^2 + ab)(-ay - by)$$

NO  
GCF

MUST

SWITCH

GROUP W/ SWITCH

2<sup>nd</sup> Term to End

$$(y^2 - ay)(-by + ab)$$

$$(y^2 - ay)(-by + ab)$$

$$y(y - a) - b(y - b)$$

$$(y - a)(y - b)$$