Name: _____ Hour: _____ Date: _____

# Honors Factoring Completely Notes

**What is a GCF?** Greatest Common Factor → could be number or variable

The largest "thing" that goes into ALL terms in a polynomial

Factor out the GCF of the following polynomials.

1) $2x + 12$

GCF = 2

$2(x+6)$

2) $3x^5 + 12x^4 - 9x^3 + 24x^2$

$3(x)(x)xxx + 12(x)(x)xx - 9(x)(x)x + 24(x)(x)$

GCF: $3x^2$

$3x^2(x^3 + 4x^2 - 3x + 8)$

3) $x^4y + x^3y^2 + x^2y^3 + xy^4$

GCF: $xy$

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

4) $3x^2y^3 + 9x^3y^5$

GCF: $3x^2y^3$

$3x^2y^3(1 + 3xy^2)$

**Factoring completely...**

You take the GCF then factor what's left over

Factor the following polynomials *completely*.

1) $12x^2 - 64x + 80$

$4(3x^2 - 16x + 2$

Factor

$6x$ $60$ $3x$ $-10$ $-16$ $-2$

$4(x-2)(3x-10)$

2) $9x^4 - 75x^3 + 126x^2$

$3x^2(3x^2 - 25x + 42)$

$1$ $126$ $3x$ $-7$ $-18$ $-25$ $6$

$3x^2(3x-7)(x-6)$

3) $x^3 - 9x$

$x(x^2 - 9)$

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