Factoring

Greatest common Factor (GCF): largest term that can be divided out of every term in the polynomial.

- Ex 1) Factor $\frac{24x^4}{6x^2} - \frac{12x^3}{6x^2} + \frac{18x^2}{6x^2}$ GCF: $6x^2$

$$6x^2(4x^2 - 2x + 3)$$

- Ex 2) Factor $\frac{252a^7b^3}{12a^4b^2} + \frac{60a^6b^2}{12a^4b^2} - \frac{108a^4b^2}{12a^4b^2}$ GCF: $12a^4b^2$

$$12a^4b^2(21a^3b + 5a^2 - 9)$$

you try: $\frac{14x^3y^2z}{xy} + \frac{7x^2yz}{xy} - \frac{xy^3}{xy}$ GCF: xy

$$xy(14x^2yz + 7xz - y^2)$$

° **Difference** of **perfect squares**

subtraction

↳ $4, 9, 16, 100, 36, x^2, x^4$
$81, 4x^2$

° Ex 3) factor: $x^2 - 9$

$\sqrt{x^2} = x$

$\sqrt{9} = 3$

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

° Ex 4) factor: $16m^2 - 1$

$\sqrt{16m^2} = 4m$

$\sqrt{1} = 1$

$(4m+1)(4m-1)$

° Ex 5) factor: $\frac{128k^2}{2} - \frac{50}{2}$ GCF: 2

$2(64k^2 - 25)$

$\sqrt{64k^2} = 8k$

$\sqrt{25} = 5$

$2(8k+5)(8k-5)$

factoring Trinomials

1) multiply 1st & last terms
2) find factors that add up to the middle term
3) replace middle term with both factors
4) factor by grouping

• Ex 6) factor x^2+x-6

$-6x^2$

$3x \quad -2x$

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

$\frac{x^2}{x} \quad \frac{+3x}{x} \quad \frac{-2x}{-2} \quad \frac{-6}{-2}$

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

$\boxed{(x+3)(x-2)}$

• Ex 7) factor: $12m^2-5m-3$

$-36m^2$

$-9m \quad 4m$

$\frac{12m^2}{3m} \quad \frac{-9m}{3m} \quad + \frac{4m}{1} \quad \frac{-3}{1}$

$3m(4m-3) \quad +1(4m-3)$

$\boxed{(3m+1)(4m-3)}$

*Ex 8) $15y^2 + 59y + 56$

$840y^2$

$24y \quad 35y$

$\frac{15y^2}{3y} + \frac{24y}{3y} \mid + \frac{35y}{7} + \frac{56}{7}$

$3y(5y+8) \mid +7(5y+8)$

$(5y+8)(3y+7)$

$y = \frac{840}{x}$

2nd Graph