5-4 Factoring of Polynomials Day 1

Objective: Factor polynomials.
Simplify polynomial quotients by factoring.

Greatest Common Factor (GCF)

EX 1. $10a^3b^2 + 15a^2b - 5ab^3$

$$5ab(2a^2b + 3a - b^2)$$

EX 2. $6x2y^2 - 2xy^2 + 6x^3y$

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

Difference of 2 Squares: $a^2 - b^2 = (a + b)(a - b)$

Sum of 2 Cubes: $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

Difference of 2 Cubes: $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

Ex3) $x^2 - 36$ $= (x + 6)(x - 6)$

Ex4) $y^4 - z^2$ $= (y^2 + z)(y^2 - z)$

$y^2 \cdot y^2$

Ex5) $p^4 - 1$ $= (p^2 + 1)(p^2 - 1)$
$= (p^2 + 1)(p + 1)(p - 1)$

Ex6) $2^3 + p^3$ $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$

$a = 2$
$b = p$

$= (2 + p)(4 - 2p + p^2)$

Ex7) $c^3 d^3 + 27$

$(cd)^3 + (3)^3$
$a = cd, b = 3$

$= (cd + 3)(c^2 d^2 - 3cd + 9)$

Ex8) $x^3 - y^3$

$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$

$a = x$
$b = y$

$= (x - y)(x^2 + xy + y^2)$

① $9m^4 = 3m^2(3m^2)$

⑩ $x^2 - 4x = \boxed{x(x-4)}$

⑮ $6t^2 + 15t = \boxed{3t(2t + 5)}$

⑭ $4x^3 - 10x^2 + 6x$

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

㊲ $m^2 - 12$ $\boxed{\text{Prime}}$

㉗ $p^3 + 512$

$p^3 + 8^3 = \boxed{(p+8)(p^2 - 8p + 64)}$

$a = p$
$b = 8$

5. $8x^2 y + 12x^3 y^2 = 4x^2 y(2 + 3xy)$