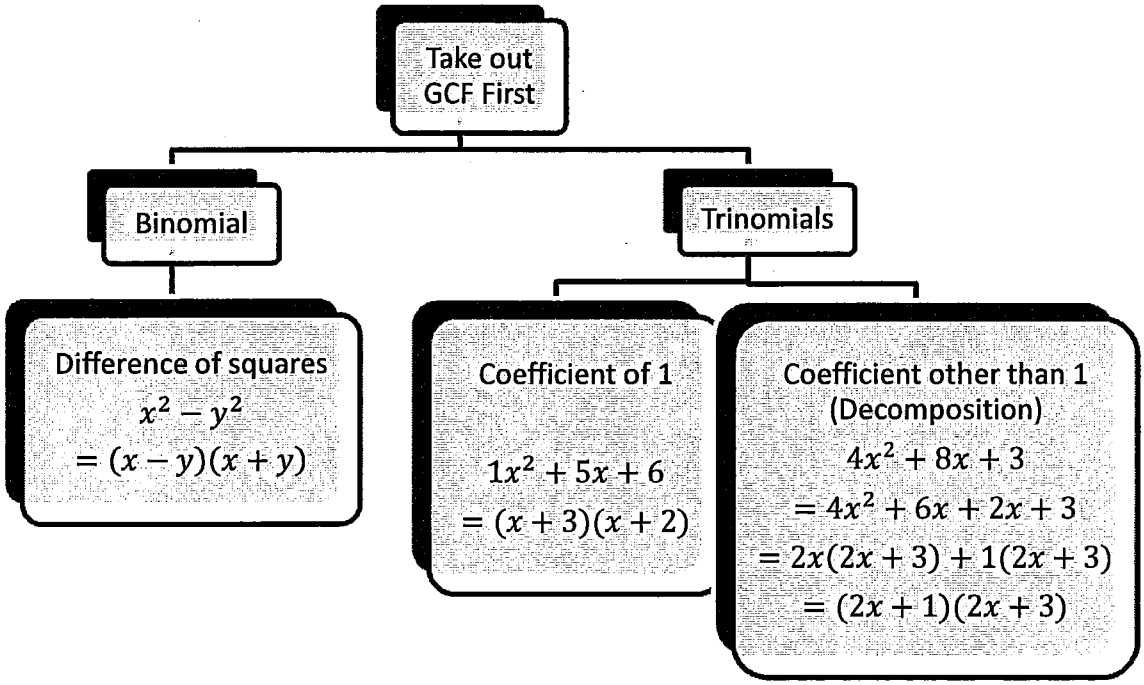
3.0 Factoring Polynomial Expressions: Part 1

Review of Factoring:



Basics: Factor the following.

1. $12x^2y^3 - 8x^4y^2 + 4x^5y^2$

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

2. $x^2 + 5x - 14$

$= (x + 7)(x - 2)$

$7 \times -2 = -14$

$7 + -2 = 5$

3. $x^4 - 3x^2 - 18$

$-6 \times 3 = -18$

$-6 + 3 = -3$

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

4. $5x^2 + 12x + 4$ (m = 5, n = 4)

$mn = 5(4) = 20$

$10 \times 2 = 20$

$10 + 2 = 12$

$= 5x^2 + 10x + 2x + 4$

$= 5x(x + 2) + 2(x + 2)$

$= (5x + 2)(x + 2)$

5. $6x^3 - 2x^2 - 4x$

$= 2x(3x^2 - x - 2)$

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

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

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

$mn = (3)(-2)$

$= -6$

$-3 \times 2 = -6$

$-3 + 2 = -1$

6. $4x^2 + 11xy + 6y^2$

$(4)(6) = 24$

$= 4x^2 + 8xy + 3xy + 6y^2$

$8 \times 3 = 24$

$8 + 3 = 11$

$= 4x(x+2y) + 3y(x+2y)$

$= (4x+3y)(x+2y)$

7. $25m^2 + 60mn + 36n^2$

$(25)(36) = 900$

$= 25m^2 + 30mn + 30mn + 36n^2$

$30 \times 30 = 900$

$30 + 30 = 60$

$= 5m(5m+6n) + 6n(5m+6n)$

$= (5m+6n)(5m+6n)$

$= (5m+6n)^2$

8. $9a^2 - 16b^2$

$= (3a)^2 - (4b)^2$

$= (3a+4b)(3a-4b)$

Beyond Basics: Factor the following.

9. $16m^4 - 1^2$

$= (4m^2+1)(4m^2-1)$

$= (4m^2+1)(2m-1)(2m+1)$

10. $4x^4 - 17x^2 + 4$

$4(4) = 16$

$-16 \times -1 = 16$

$-16 + -1 = -17$

$= 4x^4 - 16x^2 - x^2 + 4$

$= 4x^2(x^2-4) - 1(x^2-4)$

$= (4x^2-1)(x^2-4)$

$= (2x-1)(2x+1)(x-2)(x+2)$