

# INTERMEDIATE ALGEBRA

GPS # 22

5.5 SPECIAL TYPES OF FACTORING II

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## Useful Types of Factoring:

1. Difference of Square:  $x^2 - y^2 = (x - y)(x + y)$

2. Perfect Square Trinomial:  $x^2 + 2xy + y^2 = (x + y)^2$   
 $x^2 - 2xy + y^2 = (x - y)^2$

3. Difference of Cubes:  $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$

4. Sum of Cubes:  $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$

## Hints: To factor a polynomial,

a. Factor out any common factor

b. If the polynomial is a binomial: 1,3,4

c. If the polynomial is a trinomial: 2

d. If the polynomial is more than 3 terms,

try "factoring by grouping"

Factor each polynomial.

1. a)  $3x(4+b) - 2x(4+b) =$

$(4+b)(3x - 2x)$

$(4+b)x$

$4x + bx$

b)  $4pq^2 - 16p^2q = 4pq(q - 4p)$

2. a)  $9x^2 - 64y^2 = (3x)^2 - (8y)^2$

$(3x - 8y)(3x + 8y)$

b)  $64p^3 - 1000 = (4p)^3 - (10)^3$

$(4p - 10)(16p^2 + 40p + 100)$

3. a)  $9r^2 - 24r + 16 = (3r - 4)^2$

$(3r - 4)^2$

b)  $4t^2 + 12t + 9 =$

$(2t + 3)^2$

4. a)  $m^3 - 5mn^2 + m^2n - 5n^3 =$

$m(m^2 - 5n^2) + n(m^2 - 5n^2)$

$(m^2 - 5n^2)(m + n)$

$(m - \sqrt{5}n)(m + \sqrt{5}n)(m + n)$

b)  $12x^3 + 4x^2 - 27x - 9 =$

$4x^2(3x + 1) - 9(3x + 1)$

$(3x + 1)(4x^2 - 9)$

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