

# INTERMEDIATE ALGEBRA

GPS # 21

5.5 SPECIAL TYPES OF FACTORING

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

rw  
ru

(x+y) (x-y)

Conjugate of each other

Factor each polynomial.

1. a)  $x^2 - 9 = x^2 - 3^2$   
 $(x-3)(x+3)$

b)  $4p^2 - 64 = (2p)^2 - (8)^2$   
 $= (2p-8)(2p+8)$

2. a)  $9x^2 + 12x + 4 = (3x)^2 + 12x + 4$   
 $(3x+2)^2$

b)  $16p^2 - 40pm + 25m^2 =$   
 $(4p-5m)^2$

3. a)  $8r^3 - 27 = (2r)^3 - (3)^3$   
 $(2r-3)(4r^2 + 6r + 9)$

b)  $x^3 - 1000y^3 = (x)^3 - (10y)^3$   
 $(x-10y)(x^2 + 10xy + 100y^2)$

4. a)  $27t^3 + 64 = (3t)^3 + (4)^3$   
 $(3t+4)(9t^2 - 12t + 16)$

b)  $(z+1)^3 + y^3 =$   
 $(z+1+y)((z+1)^2 - (z+1)y + y^2)$

$(z+1) \cdot y$   
 $zy + y$