

Sums and Differences of Cubes:

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

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

1.  $x^3 - 8$

2.  $27x^3 + y^3$

3.  $8x^3 - 27$

4.  $64x^3 + 1$

Factoring Trinomials –  $ax^2 + bx + c$

1.  $5x^2 - 7x + 2$

2.  $3x^2 + 10x - 8$

3.  $2y^2 + 15y + 7$

4.  $7a^2 - 11a + 4$

5.  $5n^2 + 17n + 6$

6.  $4y^2 + 8y + 3$

7.  $6x^2 - 7x - 20$

8.  $2n^2 - 3n - 14$

9.  $5n^2 + 2n + 7$

Factoring by Grouping (when have 4 terms)

1.  $8x^3 - 64x^2 + x - 8$

2.  $12x^3 + 2x^2 - 30x - 5$

3.  $24x^3 - 64x^2 - 21x + 56$

4.  $12x^3 - 21x^2 + 28x - 49$

5.  $4x^3 - 12x^2 - 5x + 15$

## Factoring – Putting it all Together

**Example:**

$$5x^2 + 20x - 60 = 5(x^2 + 4x - 12) = 5(x + 6)(x - 2)$$

1.  $2x^2 - 8$

2.  $2x^2 + 8x + 6$

3.  $3n^2 + 9n - 30$

4.  $6x^2 - 26x - 20$

5.  $2x^2 + 12x - 80$

6.  $5t^2 + 15t + 10$

7.  $8n^2 - 18$

8.  $14x^2 + 7x - 21$

9.  $4x^2 + 16x + 16$

10.  $18x + 12x^2 + 2x^3$

11.  $2x - 2xy^2$

12.  $3t^3 - 27t$

13.  $24a^2 - 30a + 9$

14.  $10x^2 + 15x - 10$

15.  $3x^2 - 42x + 147$

16.  $4x^4 - 4x^2$

17.  $4x^3 - 32$

18.  $x^4 + 64x$