Factoring Methods **Name**_____

What is factoring? Finding what multiplies to get to that problem

Factors: 6x and (x+1) **Factored: 6x(x+1)** **Multiplied:** $6x^2 + 6x$

$6x \bullet (x + 1) = 6x^2 + 6x$

Factors: (x-1) and (x+1) **Factored: (x-1)(x+1)** **Multiplied:** $x^2 - 1$

$(x - 1) \bullet (x + 1) = x^2 + x - x - 1 = x^2 - 1$

Factors: (x+1) and (x+1) **Factored: (x+1)(x+1)** **Multiplied:** $x^2 + 2x + 1$

$(x + 1) \bullet (x + 1) = x^2 + x + x + 1 = x^2 + 2x + 1$

FACTOR the following

1. Always take care of Greatest Common Factor (GCF) first
   a. $3x^2 + 9x$ b. $15x^3 + 25x^2 - 5x$ c. $-14x^2y + 12xy^2$

2. Is it a difference of two squares? $a^2 - b^2 = (a - b)(a + b)$
   a. $x^2 - 49$ b. $36x^2 - 1$ c. $16x^2 - 4y^2$

3. Are there four terms? If yes, use grouping method.
   a. $2x^3+4x^2+x+2$ b. $3x^3-9x^2-4x+12$ c. $2x^3+3x^2-2x-3$

4. Are there three terms and a=1? If yes, use box/guess and check.
   a. x^2+6x+5 b. $x^2-7x+12$ c. $x^2+3x-28$

5. Are there three terms and a is not 1? If yes, use box/ guess and check.
   a. $2x^2 + 3x + 1$ b. $5x^2 - 13x + 6$ c. $3x^2 - 4x - 4$

Solve by Factoring= Find what x is by using the Zero Product Property MUST = 0 first

6. $3x^2 + 9x=0$

7. $x^2 - 49 =0$

8. $x^2+6x+5=0$

9. $36x^2 = 1$

10. $x^2+3x-28=0$

11. $3x^3-9x^2-4x=-12$

12. $2x^3+3x^2=2x+3$

13. $x^2=7x-12$

14. $2x^2 +3x + 1=0$

15. $5x^2 =13x -6$

16. $3x^2 -4x =4$