

Factoring Methods

Name _____

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

Factors: $6x$ and $(x+1)$

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

Factored: $6x(x+1)$

Multiplied: $6x^2 + 6x$

Factors: $(x-1)$ and $(x+1)$

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

Factored: $(x-1)(x+1)$

Multiplied: $x^2 - 1$

Factors: $(x+1)$ and $(x+1)$

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

Factored: $(x+1)(x+1)$

Multiplied: $x^2 + 2x + 1$

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