

Name: _____ Date: _____

GCF & Factoring Trinomials when a is not equal to 1

⊙ **Factoring Trinomials:** Writing the polynomial as a product of 2 binomials.

- Check for GCF 1st. Divide out the GCF of each term if one exists.
- When factoring $ax^2 \pm bx \pm c$, first find factors of **a** and **c**.
- Check the products of the inner and outer terms to see if the sum is **b**.
- When **c** is POSITIVE, both signs inside the parentheses will be the same as the middle term.
- When **c** is NEGATIVE, the signs in the parentheses will be different.

Factor each trinomial completely.

1. $x^2 + 9x + 14$

$(x+2)(x+7)$

2. $x^2 - 4x - 21$

$(x-7)(x+3)$

3. $5x^2 + 11x + 2$

$(x+2)(5x+1)$

4. $3x^2 + 16x - 35$

$(x+7)(3x-5)$

5. $3x^2 - 10x + 3$

$(x-3)(3x-1)$

6. $2x^2 - 7x + 5$

$(x-1)(2x-5)$

7. $3x^2 - 8x + 4$

$(x-2)(3x-2)$

8. $5x^2 - 39x - 8$

$(x-8)(5x+1)$

9. $\frac{14x^2}{2} - \frac{32x}{2} + \frac{18}{2}$

$2(7x^2 - 16x + 9)$
 $2(x-1)(7x-9)$

10. $2x^2 - 17x + 35$

$(x-5)(2x-7)$

11. $\frac{15x^2}{3} - \frac{6x}{3} - \frac{48}{3}$

$3(5x^2 - 2x - 16)$
 $3(x-2)(5x+8)$

12. $7x^2 + 61x - 90$

$(x+10)(7x-9)$

13. $5x^2 + 39x - 54$

$(x+9)(5x-6)$

14. $7x^2 - 45x + 18$

$(x-6)(7x-3)$

15. $x^2 - x - 90$

$(x+9)(x-10)$

Factor each trinomial completely.

16. $x^2 + 10x + 25$

$$(x+5)(x+5) = \boxed{(x+5)^2}$$

17. $2x^2 - 5x - 63$

$$(x-7)(2x+9)$$

18. $4x^2 - 17x - 42$

$$(4x+7)(x-6)$$

19. $\frac{2x^2}{2} + \frac{16x}{2} + \frac{32}{2} = 2(x^2 + 8x + 16)$

$$2(x+4)(x+4)$$

$$= \boxed{2(x+4)^2}$$

20. $2x^2 - 7x + 5$

$$(x-1)(2x-5)$$

21. $9x^2 + 5x - 4$

$$(9x-4)(x+1)$$

22. $9x^2 - 6x + 1$

$$(3x-1)(3x-1) = \boxed{(3x-1)^2}$$

23. $9x^2 + 15x - 14$

$$(3x+7)(3x-2)$$

24. $\frac{5x^3}{5x} + \frac{30x^2}{5x} - \frac{200x}{5x} = 5x(x^2 + 6x - 40)$

$$\boxed{5x(x+10)(x-4)}$$

25. $3x^2 - 10x + 7$

$$\boxed{(x-1)(3x-7)}$$

26. $3x^2 + 19x + 6$

$$(x+6)(3x+1)$$

27. $\frac{15x^2}{5} - \frac{15x}{5} - \frac{50}{5} = 5(3x^2 - 3x - 10)$

↑
Not
factorable28. The area of a rectangle is represented by the expression $6x^2 + 17x + 12$. The length is given as $(2x+3)$. What is an expression for the width?

$$2x+3 \quad \boxed{}$$

$$\underbrace{(2x+3)}_m \underbrace{(3x+4)}_n = \underbrace{6x^2}_{mn} + \underbrace{17x}_{mn} + \underbrace{12}_{mn}$$

29. The area of a rectangle is represented by the expression $5x^2 + 12x + 7$. The length is given as $(x+1)$. What is an expression for the width?

$$x+1 \quad \boxed{}$$

$$(x+1)(5x+7) = 5x^2 + 12x + 7$$