

$$12xy^2 - 16y^3$$

$$4y^2(3x - 4y)$$

\* GCF

$$4. \quad 6x^2 - 5x - 4 \quad \begin{array}{r} -24 \\ 3 \times -8 \\ -5 \end{array}$$

$$(x + \frac{3}{2})(x - 8) \quad \text{* trinomial} \\ (2x + 1)(3x - 4) \quad \text{LC} \neq 1$$

$$7. \quad (x^3 + 6x^2)(25x - 150) \\ x^2(x + 6) - 25(x + 6) \\ (x + 6)(x^2 - 25)$$

$$10. \quad (x + 6)(x - 5)(x + 5)$$

\* grouping + Diff. of perf. Squares

$$3(12x^2 - 4x - 1) - 6 \begin{array}{r} -12 \\ -4 \times 2 \\ -4 \end{array}$$

$$3(x - \frac{6}{12})(x + \frac{1}{12}) = 3(2x - 1)(6x + 1)$$

$$13. \quad \text{* GCF + Trinomial LC} \neq 1$$

$$4(-3x^3 - x^2 + 108x + 36)$$

$$4[-x^2(3x + 1) + 36(3x + 1)]$$

$$4(3x + 1)(36 - x^2) = 4(3x + 1)(6 + x)(6 - x)$$

$$16. \quad x^2 + 2x - 63 \quad \begin{array}{r} -63 \\ 9 \times -7 \\ 2 \end{array}$$

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

\* Trinomial LC = 1

$$19. \quad 4x^2y(3 - 5y + 7xy^2)$$

\* GCF

$$22. \quad x^2 + 26x + 169 \quad \begin{array}{r} 169 \\ 13 \times 13 \\ 26 \end{array}$$

$$(x + 13)(x + 13)$$

$$(x + 13)^2$$

\* Perfect Trinomial

$$9x^2 - 100$$

$$(3x + 10)(3x - 10)$$

\* Diff. of Perfect Squares

$$5. \quad (x^3 - x^2) + (3x - 3) \\ x^2(x - 1) + 3(x - 1)$$

$$(x - 1)(x^2 + 3)$$

\* grouping

$$8. \quad 4x(x^2 + 3x - 1) \quad \begin{array}{r} -1 \\ -1 \times 1 \\ 3 \end{array}$$

\* GCF

Trinomial = NOT Factorable

11.

$$(4x^2 + 1)(4x^2 - 1)$$

$$(4x^2 + 1)(2x + 1)(2x - 1)$$

$$14. \quad 5x(x^2 - 8x - 48) \quad \begin{array}{r} -48 \\ -12 \times -4 \\ -8 \end{array}$$

$$5x(x - 12)(x + 4)$$

\* GCF + Trinomial LC = 1

$$17. \quad (64x^2 - 9y^2)$$

$$(8x + 3y)(8x - 3y)$$

\* Diff. of Perf. Squares

$$20. \quad 8(6x^2 + 11x - 7) \quad \begin{array}{r} -42 \\ -3 \times 14 \\ 11 \end{array}$$

$$8(x^2 + 11x - 42)$$

$$8(x - 3)(x + 14)$$

$$8(2x - 1)(3x + 7) \quad \text{* GCF + Trinomial LC} \neq 1$$

$$x^8 - 1$$

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

$$(x^4 + 1)(x^2 + 1)(x^2 - 1)$$

$$(x^4 + 1)(x^2 + 1)(x + 1)(x - 1)$$

\* Diff. of Perfect Squares  $\times 3$

$$x^2 + 3x - 40$$

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

$$\begin{array}{r} -40 \\ 8 \times -5 \\ 3 \end{array}$$

\* trinomial LC = 1

$$6. \quad 5(x^2 - 3x - 4) \quad \begin{array}{r} -4 \\ -4 \times 1 \\ -3 \end{array}$$

$$5(x - 4)(x + 1)$$

\* GCF + Trinomial LC = 1

$$9. \quad x^2 - 11x - 840 \quad \begin{array}{r} -840 \\ -35 \times 24 \\ -11 \end{array}$$

$$(x - 35)(x + 24)$$

\* Trinomial LC  $\neq 1$

$$12. \quad 2x^2(3 - 10x^5)$$

\* GCF

$$15. \quad (x^3 + x^2)(-x - 1)$$

$$x^2(x + 1) - 1(x + 1)$$

$$(x + 1)(x^2 - 1)$$

\* Grouping + Diff. of Perf. Squares

$$(x + 1)(x - 1)(x + 1)$$

$$18. \quad x^2 + 10x + 24 \quad \begin{array}{r} 24 \\ 4 \times 6 \\ 10 \end{array}$$

$$(x + 4)(x + 6)$$

\* Trinomial LC = 1

$$21. \quad 4(x^2 + 10x + 25) \quad \begin{array}{r} 25 \\ 5 \times 5 \\ 10 \end{array}$$

$$4(x + 5)(x + 5)$$

\* GCF + perfect trinomial

$$4(x + 5)^2$$

$$24. \quad 6x^3y^7(4x^2y - 5y^2 + 7x^2 + 3x^2y)$$

\* GCF

\* GCF + Grouping + Diff. of Perf. Squares