Name_____GCF Factoring, Special Polynomials, Factoring Trinomials Period____

Helpful DESMOS file https://www.desmos.com/calculator/d8gur8yzhw

Difference of Two Squares DOTS There are OPPOSITE ROOTS (This graph is symmetric about y axis)	Perfect Square Trinomial PST There are TWO REPEATING ROOTS (This graph is TANGENT to x axis at some point)	Sum and Difference of Cubes S.O.AP There are ONE REAL and TWO IMAGINARY ROOTS (This graph only crosses the x axis in one point)
$x^2 - a^2 = (x + a)(x - a)$ $a^2x^2 - b^2 = (ax + b)(ax - b)$	$x^2 + 2ax + a^2 = (x + a)(x + a)$ $x^2 - 2bx + b^2 = (x - b)(x - b)$ $a^2x^2 + 2abx + b^2 = (ax + b)(ax + b)$ $a^2x^2 - 2abx + b^2 = (ax - b)(ax - b)$	$x^3 - a^3 = (x - a)(x^2 + ax + a^2)$ $x^3 + a^3 = (x + a)(x^2 - ax + a^2)$ $a^3x^3 - b^3 = (ax - b)(a^2x^2 + abx + b^2)$ $a^3x^3 + b^3 = (ax + b)(a^2x^2 - abx + b^2)$

Given Polynomial	GCF of Polynomial If NONE state NONE	Factored OUT GCF polynomial If NONE state NONE	Completely Factored Polynomial	Solutions/Roots to Polynomial Equation
$5x^2 - 20 = 0$				
$5x^2 - 20x + 20 = 0$				
$5x^3 - 20x = 0$				
$5x^3 + 20x^2 + 20x = 0$				

Given Polynomial	GCF of Polynomial If NONE state NONE	Factored OUT GCF polynomial If NONE state NONE	Completely Factored Polynomial	Solutions/Roots to Polynomial Equation
$5x^2 - 20x - 25 = 0$				
$5x^2 + 10x - 15 = 0$				
$5x^4 - 5x^3 - 10x^2 = 0$				
$5x^3 + 20x^2 + 15x = 0$				

Sum or difference of cubes polynomial	Cube root of first term	Cube root of last term	Binomial factor of polynomial SAME (as original)	Trinomial factor of polynomial OPPOSITE (middle term) and ALWAYS POSITIVE (last term)	ONLY real root of polynomial
$x^3 - 8$ a.k.a $x^3 - 2^3$					
$8x^3 + 27$ a.k.a $(2x)^3 + 3^3$					