Using Patterns and Formulas Assignment

Use the ***difference of two squares*** pattern $A^2 - B^2 = (A-B)(A+B)$ to FACTOR the following.

$x^2 - 49$

$(x)^2 - (7)^2$

$(A)^2 - (B)^2 = (A-B)(A+B)$

$\boxed{(x-7)(x+7)}$

$5x^2 - 80$

$5(x^2-16)$

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

$A^2 - B^2 \rightarrow (A-B)(A+B)$

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

$64x^2 - 9y^2$

$(8x)^2 - (3y)^2$

$A^2 - B^2 \rightarrow (A-B)(A+B)$

$\boxed{(8x-3y)(8x+3y)}$

$4x^2 - 81$

$(2x)^2 - (9)^2$

$A^2 - B^2 \rightarrow (A-B)(A+B)$

$\boxed{(2x-9)(2x+9)}$

$x^4 - 16$

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

$A^2 - B^2 \rightarrow (A-B)(A+B)$

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

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

diff of squares again!

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

$-x^2 + 25$

$-(x^2-25)$

$-((x)^2-(5)^2)$

$A^2 - B^2 \rightarrow (A-B)(A+B)$

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

Use the ***perfect square trinomial*** pattern $(A+B)^2 = A^2 + 2AB + B^2$ to EXPAND the following.

$(2x+3)^2$

$(A+B)^2 = A^2 + 2AB + B^2$

$= (2x)^2 + 2(2x)(3) + (3)^2$

$= \boxed{4x^2 + 12x + 9}$

$(-5x+1)^2$

$(A+B)^2 = A^2 + 2AB + B^2$

$= (-5x) + 2(-5x)(1) + (1)^2$

$= \boxed{25x^2 - 10x + 1}$

$(7x-y)^2$

$(A+B)^2 = A^2 + 2AB + B^2$

$= (7x)^2 + 2(7x)(-y) + (-y)^2$

$= \boxed{49x^2 - 14xy + y^2}$

$(x^4+2)^2$

$(A+B)^2 = A^2 + 2AB + B^2$

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

$= \boxed{x^8 + 4x^4 + 4}$

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

$(A+B)^2 = A^2 + 2AB + B^2$

$= (3x^3)^2 + 2(3x^3)(-y) + (-y)^2$

$= \boxed{9x^6 - 6x^3y + y^2}$

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

$(A+B)^2 = A^2 + 2AB + B^2$

$= (2x^2)^2 + 2(2x^2)(5y^2) + (5y^2)^2$

$= \boxed{4x^4 + 20x^2y^2 + 25y^4}$

Use the SUM or DIFFERENCE of Cubes to Expand the following

SUM OF CUBES

$$A^3+B^3=(A+B)(A^2-AB+B^2)$$

DIFFERENCE OF CUBES

$$A^3-B^3=(A-B)(A^2+AB+B^2)$$

x^3+125

$(x)^3+(5)^3$

$A^3+B^3 \rightarrow (A+B)(A^2-AB+B^2)$

$\rightarrow (x+5)((x)^2-(x)(5)+(5)^2)$

$\rightarrow \boxed{(x+5)(x^2-5x+25)}$

$2x^3+54$

$2(x^3+27)$

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

$A^3+B^3 \rightarrow (A+B)(A^2-AB+B^2)$

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

$\boxed{2(x+3)(x^2-3x+9)}$

$8x^3-1$

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

$A^3-B^3 \rightarrow (A-B)(A^2+AB+B^2)$

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

$\boxed{(2x-1)(4x^2+2x+1)}$

$27x^3-y^3$

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

$A^3-B^3 \rightarrow (A-B)(A^2+AB+B^2)$

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

$\boxed{(3x-y)(9x^2+3xy+y^2)}$

$16x^3-2$

$2(8x^3-1)$

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

$A^3-B^3 \rightarrow (A-B)(A^2+AB+B^2)$

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

$\boxed{2(2x-1)(4x^2+2x+1)}$

Challange

x^6-y^6

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

$A^3-B^3 \rightarrow (A-B)(A^2+AB+B^2)$

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

difference of squares

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

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