Factoring Polynomials

1) GCF
2) Difference of 2 Squares
3) Basic trinomial ($a=1$)
4) Split the Middle ($a \neq 1$)
5) Grouping (4 terms)

6) Factoring in Quadratic Form:

a) $x^{8}-2x^{4}-24$ "$x^{2}-2x^{1}-24$"

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$(x^{4}-6)(x^{4}+4)$

$-6x^{4}$

$+4x^{4}$

b) $\sqrt{16x^4 - \sqrt{81}}$ DOTS (conjugate pairs)

$(4x^2+9)(4x^2-9)$ DOTS

$\boxed{(4x^2+9)(2x+3)(2x-3)}$

c) $3p^8 + 15p^5 + 18p^2$

GCF $3p^2(p^6 + 5p^3 + 6)$

A M

$\boxed{3p^2(p^3+3)(p^3+2)}$

7) Sum + Difference of Perfect Cubes:

$$\sqrt[3]{a^3} + \sqrt[3]{b^3} = (a+b)(a^2 - a\cdot b + b^2)$$

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$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

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"SOAP": Same, opposite, always Positive

a) $\sqrt[3]{x^3}+\sqrt[3]{1}=(x+1)(x^2-1x+1)$

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b) $\sqrt[3]{27x^3}-\sqrt[3]{8}=(3x-2)((3x)^2+(3x\cdot 2)+2^2)$

a b

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$(3x-2)(9x^2+6x+4)$

c) $\sqrt[3]{x^3}-\sqrt[3]{125}=(x-5)(x^2+5x+25)$

x 5

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d) $16x^5+54x^2$

*GCF $2x^2(8x^3+27)$

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

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$2x^2$	$(2x+3)$	$(4x^2-6x+9)$
$x=0$	$x=\frac{-3}{2}$	$x=$?