6-3 Factoring Polynomials

Remember the factoring patterns you already know:

Difference of two squares: $a^2 - b^2 = (a-b)(a+b)$

Perfect square trinomials: $a^2 + 2ab + b^2 = (a+b)^2$

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

There are two other factoring patterns that will prove useful:

Sum of two cubes: $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$

Difference of two cubes: $a^3 - b^3 = (a-b)(a^2 + ab + b^2)$

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

Write out the polynomial.	$x^3 - x^2 + x - 1$
Group by common factor.	$(x^3 - x^2) + (x - 1)$
Factor.	$x^2(x - 1) + 1(x - 1)$
Regroup.	$(x^2 + 1)(x - 1)$

(B) $x^4 + x^3 + x + 1$

Factor.

$3x^3 + 7x^2 + 4x$

$4a^4b + 8a^3b^3 - 10a^2b^4$