Math Forum - Problem of the Week

Polynomial Puzzler [Problem #3580]

Consider the following four polynomials, labeled A - D:

A. $(2x^2 - 4x)$
B. $(x^3 - 1)$
C. $(-3x^3 + x^2 - 4x)$
D. $(x^5 + x^2 - 3)$

Find an algebraic expression that uses each of the four polynomials once and simplifies to:

$$x^8 + 3$$

Your expression may involve any combination of adding, subtracting, and multiplying the polynomials. Be sure to explain the thinking you used to find your answer, and show that your expression simplifies correctly.

Note: Not sure where to begin? If you multiply the right pair of polynomials to start, it will go pretty quickly after that.

Extra: Again using the four polynomials one time each, write an expression that simplifies to:

$$2x^7 - x^6 - x^5 + 6x^4 - 7x^3 - 5x^2 + 8x$$

Please type exponents using '^', which is the shifted '6' key. For example, x^2 is typed as x^2. Also, please use spaces between terms in your polynomials to make them easier to read.

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