1. Use the partial fraction ideas of Section 8.4 to solve the following integrals.

(a)
$$\int \frac{x^2 + x + 1}{x + 1} dx$$

(b) $\int \frac{x^2 + x + 1}{x^2 + 1} dx$

2. Integrate the following:

(a)
$$\int \frac{x^2 + x + 1}{x^3 - 1} dx$$

(b) $\int \frac{x^2 + x + 1}{x^3 + 1} dx$

3. For the following integrals, find the constants A, B, etc., and then evaluate the integrals.

(a)
$$\int \frac{1}{x(x^2+1)} dx$$

(b) $\int \frac{1}{x^2(x^2+1)} dx$

- 4. (a) Using the Problems 3a and 3b above as guides, find the constants for $\int \frac{1}{x^6(x^2+1)} dx$, and note that after finding the constants, the integral can be evaluated in a straightforward manner.
 - (b) After doing part (a), hopefully you can see how to proceed with $\int \frac{1}{x^n(x^2+1)} dx$, for any positive integer n.