AP Calculus Final Review 4 – Additional Techniques of Integration

6.3 Partial Fractions and Quadratic Expressions; 6.4 Miscellaneous Substitutions

1. Evaluate the integrals by partial fraction decompositions.

   (a) $\int \left(x^3+3x^2+3x+63\right)/\left(x^2-9\right)^2\,dx$

   (b) $\int \left(x^2+3x+1\right)/\left(x^4+5x^2+4\right)dx$

2. Evaluate the integrals with quadratic expressions

   (a) $\int 1/(x^2-2x+5)\,dx$

(b) $\int x/(x^2+2x+7)^2 dx$

(c) $\int (x+2)/(x^2+x+3) dx$

3. Evaluate the integrals with miscellaneous substitutions.
   (a) $\int 1/(\sin x - \cos x)\, dx$

(b) $\int \cos 2x/(\sin^2 x - 2\cos x + 3) dx$