Due Tuesday, September 6th at the beginning of class. Please use additional paper as necessary to submit CLEAR and COMPLETE solutions.

Use the partial fraction decomposition to integrate these rational functions.

1. $\displaystyle\int \frac{x^2 - x + 5}{x^2 + x - 6}dx$

2. $\displaystyle\int \frac{y^2 + 3}{y^3 - 3y^2 + 3y - 1}dy$

3. $\displaystyle\int \frac{-z^3 - 26z^2 - 28z - 120}{z^4 - 16}dz$

4. $\displaystyle\int \frac{dw}{w^2 - 2w + 10}$

Use an appropriate trigonometric substitution to integrate the following. In the case of an idefinite integral, please simplify compositions of trigonometric and inverse trigonometric functions.

1. $\displaystyle\int_{\sqrt{2}}^{2} \frac{dt}{t^4\sqrt{t^2-1}}$

2. $\displaystyle\int_{0}^{2\sqrt{3}} \frac{x^3}{\sqrt{16-x^2}}$

3. $\displaystyle\int \frac{z^3}{\sqrt{z^2+1}}dz$

4. $\displaystyle\int y^2\sqrt{1-y^2}dy$