Problem 1: Integrate the following:

$$\int \frac{x^3}{\sqrt{x^2-9}}\,dx$$

Problem 2: Integrate the following:

$$\int \frac{x}{\sqrt{x^2+9}}\,dx$$

Problem 3: Integrate the following:

$$\int_0^1 \frac{dx}{(x^2+1)^{5/2}}$$

Problem 4: Integrate the following:

$$\int \frac{dx}{x^2 - 6x + 14}$$