

YT 5)

$$\int_{\sqrt{3}}^3 \frac{4}{9+x^2} dx$$

$$a=3$$
$$u=x$$
$$du=dx$$

$$4 \int \frac{1}{a^2+u^2} du = \frac{1}{a} \arctan \frac{u}{a} \Big|_{\sqrt{3}}^3$$

$$4 \cdot \frac{1}{3} \arctan \frac{x}{3} \Big|_{\sqrt{3}}^3$$

$$\frac{4}{3} \left[\arctan(1) - \arctan \frac{\sqrt{3}}{3} \right]$$

$$\frac{4}{3} \left[\frac{\pi}{4} - \frac{\pi}{6} \right]$$

$$\frac{4}{3} \left[\frac{\pi}{12} \right] = \frac{\pi}{9}$$

$$6) \int \frac{x^4-1}{x^2+1} dx$$

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

$$\frac{1}{3} x^3 - x + C$$