Tevaluate
$$\int \frac{\chi^4}{\chi^2 + 1} d\chi$$
.

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

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

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

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

$$= \frac{x^{3}}{3} - x + \arctan(x^{2}) + C$$

use integration by Parts.

$$\int 8ec^3 dd = \int \underbrace{8ecd \cdot 8ec^2 dd}_{U} dd$$

U= seco ⇒ du = seco tono do

$$dv = \sec^2 0 \ d\theta \Rightarrow v = \int \sec^2 \theta \ d\theta$$

$$\Rightarrow \int 8ec^3 0 \ d\theta = 8ec \theta \cdot Tan \theta - \int Tan \theta \cdot 8ec \theta \ Tan \theta \ d\theta$$

$$= 8ec \theta \ Tan \theta - \int 8ec \theta \ tan^2 \theta \ d\theta$$

$$= 8ec \theta \ tan \theta - \int 8ec \theta \ (8ec^2 \theta - 1) \ d\theta$$

$$= 8ec \theta \ tan \theta - \int (8ec^3 \theta - 8ec \theta) \ d\theta$$

$$= 8ec \theta \ tan \theta - \int 8ec^3 \theta \ d\theta + \int 8ec \theta \ d\theta$$

$$\int 8ec^3 \theta \ d\theta = 8ec \theta \ Tan \theta - \int 8ec^3 \theta \ d\theta + \ln |8ec \theta + tan \theta| + C$$

$$\Rightarrow \partial \int 8ec^3 \theta \ d\theta = 8ec \theta \ tan \theta + \ln |8ec \theta + tan \theta|$$

$$\Rightarrow \int 8ec^3 \theta \ d\theta = \frac{1}{2} 8ec \theta \ tan \theta + \frac{1}{2} \ln |8ec \theta + tan \theta| + C$$

$$\int \cot \theta \ d\theta = \int \frac{\cos \theta}{\sin \theta} \ d\theta = \int \frac{1}{8 \sin \theta} \cdot \frac{\cos \theta}{du} d\theta$$

Substitute U= Sin 0 => du = Cos D do

$$\Rightarrow \int \cot \theta \, d\theta = \int \frac{1}{u} \, du = \ln |u| + C$$

$$= \ln |\sin \theta| + C$$