$$\int z^{\alpha} \sqrt{z^2-1}^{\beta} dz$$

$$= \int (\sec \theta)^{\alpha} (\tan \theta)^{\beta} (\sec \theta)(\tan \theta) \, d\theta$$

$$\begin{bmatrix} z = \sec \theta \\ \sqrt{z^2-1} = \tan \theta \\ dz = (\sec \theta)(\tan \theta) \, d\theta \end{bmatrix}$$

$$= \int (\sec \theta)^{\alpha+1} (\tan \theta)^{\beta+1} \, d\theta$$

$$= \int \frac{1}{(\cos \theta)^{\alpha+1}} \frac{(\text{sen } \theta)^{\beta+1}}{(\cos \theta)^{\beta+1}} \, d\theta$$

$$= \int (\text{sen } \theta)^{\beta+1} (\cos \theta)^{-\alpha-\beta-2} \, d\theta$$