$$\int_V (\vec{\nabla} \cdot \vec{v})\, d\tau = \oint_S \mathbf{v} \cdot da$$

$$A \cdot (B \times C) = B \cdot (C \times A) = C \cdot (A \times B)$$

$$\int_V \vec{\nabla}\psi \cdot (\vec{\nabla} \times \vec{v})\, d\tau = \int_V \vec{\nabla} \cdot (\vec{v} \times \vec{\nabla}\psi)\, d\tau = \oint_S (\vec{v} \times \vec{\nabla}\psi) \cdot d\vec{a}$$

$$\rho(\vec{r}) = \frac{c}{r^2}\,\delta(1-\cos^2\Theta)$$

$$Q = \int_0^r \int_{\theta=0}^{\pi} \int_{\phi=0}^{2\pi} \cancel{r^{-2}}\, c\,\delta(1-\cos^2\Theta)\,\cancel{r^2}\sin\Theta \, d\phi \, d\Theta \, dr$$

$$= \int_0^r \int_{\Theta=0}^{\pi} 2\pi c\,\delta(1-\cos^2\Theta)\,\underline{\sin\Theta\, d\Theta}\, dr$$

I want to put:

$$\sin\Theta\, d\Theta = dx$$

$$\Rightarrow \frac{dx}{d\Theta} = \sin\Theta$$

$$\Rightarrow x = -\cos\Theta$$

$$Q = \int_0^r \int_{-1}^{1} 2\pi c\,\delta(1-x^2)\, dx\, dr$$

$$= c\int_0^r \left[2\pi \int_{-1}^{1} \frac{\delta(x-1)}{|-2x|} + \frac{\delta(x+1)}{|-2x|}\, dx\right] dr$$

$$= 2\pi c \int_0^r \frac{1}{2} + \frac{1}{2}\, dr$$

$$\boxed{Q = 2\pi c r}$$

The shape:

ρ is not zero at $\Theta = 0, \pi$,

so the shape is toward the z-axis

but changing with r