Challenge 3

The volume of a sphere of radius r is given by
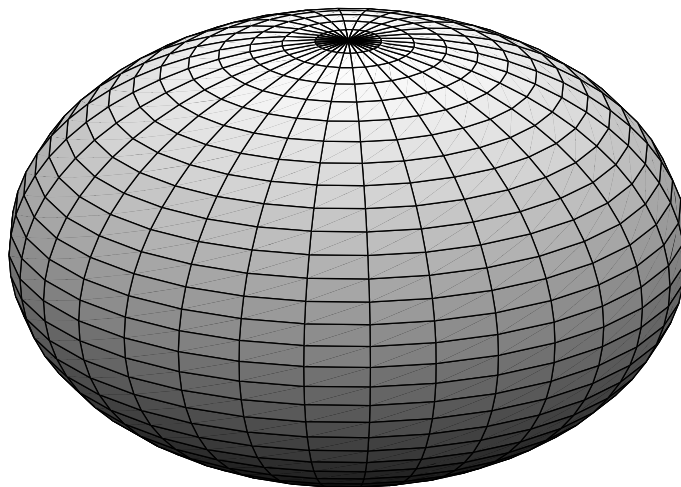
$$V = \frac{4}{3}\pi r^3$$

while the surface of the sphere of radius r is given by

$$S = 4\pi r^2$$

You can notice that

$$\frac{d}{dr}V = S$$

and this does not happen by chance. Can you explain why?

Hint: You might want to compute the volume using a new method, like the spherical shell method!