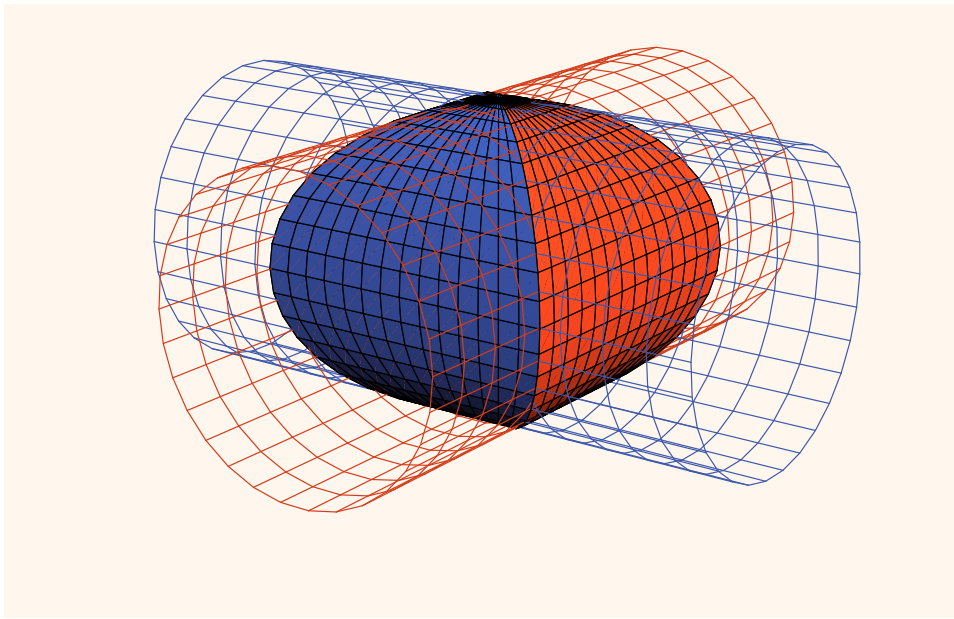


1. DoNow:

(a) Evaluate $\int \frac{2x}{x^2 + 1} dx$.

(b) In general, why does u -substitution work?

2. Two cylinders each with a radius of
- R
- intersect at right angles as shown in the diagram.



Find the volume of the intersecting region using volume elements that are nested *rectangular shells*, consider *rectangular shells*. Visualize a roll of paper towels where the the cross sections are rectangles.

Note: As always, be sure to show how you develop a typical volume element, dV , in terms of *one* variable *before* you setup an integral.

3. One hallway which is 4 feet wide meets another hallway which is 8 feet wide in a right angle. What is the length of a the longest ladder which can be carried horizontally around the corner?

