408L CLASS PROBLEMS
FEBRUARY 7TH, 2020

Problem 1. Find the volume of the solid by rotating the area under the graph of \( \sin(x) \) on \( 0 \leq x \leq \pi \) around the \( x \)-axis.

Problem 2. Find the volume of the solid obtained by rotating around the \( x \)-axis the area under the graph of \( f(x) = \frac{x+2}{\sqrt{x^2+1}} \) for \( 0 \leq x \leq t \).

Problem 3. Find the volume of a sphere of radius 1. (Hint: regard a sphere as a surface of revolution.)

Problem 4. Find the volume obtained by rotating about the \( y \)-axis the area in the first quadrant lying between the graph of \( f(x) = x + 1 \), the graph of \( g(x) = \sqrt{x} \), and the line \( y = 5 \).