1. Find the average value of the function \( f(x) = 3x^2 - 2ax - b \) on the interval \([a, b]\) \((a \neq b)\) is \(-1/4\). Find the sum of all such numbers \(b\).

2. Find the volume of the solid obtained by rotating the region bounded by the curves \( y = \cos x \) and \( y = 0 \) for \( 0 \leq x \leq \frac{\pi}{2} \) about \( y = -1\).
3. Using the method of cylindrical shells, find the volume of the solid generated by rotating the region bounded by the curves \( y = x^2 \) and \( y = -x \) about \( x = -1 \).

4. The base of a solid \( S \) is the triangular region with vertices \((0, 0)\), \((1, 0)\) and \((0, 1)\). Cross-sections perpendicular to \( y \)-axis are equilateral triangles. Find the volume of the solid \( S \).