Please do the problems in order today! Problems 1 and 2 are more important than Problem 3.

Problem 1. *For the following volume calculations, would you integrate with respect to x or with respect to y?*

a) region under $y = x^2$ from $x = 1$ to $x = 2$ rotated around x-axis, disc integration

b) same region, same rotation, shell integration

c) region in first quadrant (i.e., where $x, y \geq 0$) trapped between curves $y = x^2$, $y = 4$, and the y-axis, rotated around y-axis, shell integration

d) same region but rotated around x-axis, disc integration

Problem 2. *Set up (but don't bother computing) the integrals from (a) and (b) in the previous problem.*

Problem 3. *Find* $\displaystyle\int \ln(x^2 + 4)\, dx$.