1. [10 points] Maize and Blue Jewelry Company is trying to decide on a design for their signature aMaize-ing bracelet. There are two possible designs: type W and type J. The company has done research and the two bracelet designs are equally pleasing to customers. The design for both rings starts with the function $C(x) = \cos\left(\frac{\pi}{2}x\right)$ where all units are in millimeters. Let R be the region enclosed by the graph of $C(x)$ and the graph of $-C(x)$ for $-1 \leq x \leq 1$.

   a. [5 points] The type W bracelet is in the shape of the solid formed by rotating R around the line $x = 60$. Write an integral that gives the volume of the type W bracelet. Include **units**.

   b. [5 points] The type J bracelet is in the shape of the solid formed by rotating R around the line $y = -42$. Write an integral that gives the volume of the type J bracelet. Include **units**.

2. [10 points] Consider a solid whose base is contained between the curves $y = e^x$, $y = \mathrm{e}$, and $x = 3$. Cross-sectional slices perpendicular to the x-axis are rectangles, having length contained in the base region mentioned above and height determined by $g(x) = x^2$. Determine the exact volume of this solid.