Section 7.2

1. Find the volume of the solid obtained by revolving the region bounded by $y = e^x$, $y = 0$, $x = 0$, $x = 1$ about the $x$-axis.
2. Find the volume of the solid obtained by revolving the region bounded by \( y = 3x^2 \), \( 0 \leq x \leq 2 \), \( y = 12 \) and \( x = 0 \) about the \( y \)-axis.
3. Find the volume of the solid obtained by revolving the region bounded by $y = x^2$, $y = 4x$, about the $x$-axis, then the $y$ axis.
4. Find the volume of the solid obtained by revolving the region bounded by $y = x^2$, $y = 4$, about the line $y = 4$. 
5. Find the volume of the solid obtained by revolving the region bounded by $x = y^2$, $x = 1$, about the line $x = 1$. 
6. Find the volume of the solid obtained by revolving the region bounded by \( y = x, \ y = \sqrt{x} \), about the line \( x = -1 \).
7. Find the volume of the solid \( S \) described here: The base of \( S \) is the region bounded by \( y = x^2 \) and \( y = 4 \). Cross-sections perpendicular to the \( y \) axis are equilateral triangles.
8. Find the volume of the solid $S$ described here: The base of $S$ is the triangular region with vertices $(0, 0)$, $(3, 0)$ and $(0, 2)$. Cross-sections perpendicular to the $x$ axis are semi-circles.
9. Find the volume of the solid $S$ described here:
   The base of $S$ is the ellipse $\frac{x^2}{4} + \frac{y^2}{16} = 1$. Cross sections perpendicular to the $y$-axis are squares.
Section 7.3

10. Find the volume of the solid obtained by rotating the region bounded by the given curve(s) about the specified axis.
a.) \( y = \frac{1}{x^2}, \ x = 2, \ x = 4, \ y = 0 \) about the \( y \) axis.
b.) $y = x^2$, $y = 16$, $x = 0$ about the $x$-axis.
c.) $y = x^2$, $y = 3x$. Rotate around the $x$-axis. Now rotate around the $y$ axis.
d.) $y = x^3, y = 0, x = 1, x = 2$. Rotate around the line $x = -1$. 
e.) \( y = \sqrt{x}, \ x = 0, \ x = 4, \ y = 0 \). Rotate around the line \( y = 3 \).
f.) $y = \cos x$, $y = 0$, $x = 0$, $x = \frac{\pi}{2}$. Rotate around the line $y = 1$. Now rotate around the line $x = \frac{\pi}{2}$. Do not evaluate either integral.
g.) $y = \ln x$, $y = 0$, $x = 4$ about the $y$ axis. Do not evaluate the integral.
h.) $y = \sqrt{x}$, $y = 2 - x$, $y = 0$, around the $x$-axis. Find the volume using two different techniques of your choosing.