1. Find the area bounded by $y = \cos x$, $y = 0$, $x = 0$, $x = \frac{\pi}{3}$.

2. Find the area bounded by $y = \sin x$, $y = 0$, $x = \frac{\pi}{4}$, $x = \frac{3\pi}{2}$. 
3. Find the area bounded by \( y = x^2 \) and \( y = 2x - x^2 \).
4. Find the area bounded by $y = x - 1$ and $y^2 = 2x + 6$. 
5. Find the area bounded by $y = \sin x$, $y = \cos x$, $x = -\frac{\pi}{2}$ and $x = \frac{\pi}{2}$.
6. Find the area bounded by $y = |2 - x^2|$, $y = 0$, $x = 0$, $x = 2$. 

7. 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.
8. 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.
9. 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.
10. Find the volume of the solid obtained by revolving the region bounded by $y = x^2$, $y = 4$, about the line $y = 4$. 
11. Find the volume of the solid obtained by revolving the region bounded by $x = y^2, x = 1$, about the line $x = 1$. 
12. Find the volume of the solid obtained by revolving the region bounded by $y = x$, $y = \sqrt{x}$, about the line $x = 2$. 
13. 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 squares.
14. 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.
15. 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.) $y = \ln x$, $y = 0$, $x = 4$ about the $y$ axis. Do not evaluate the integral.