1) (5 pts) Find the area of the region enclosed by the parabolas 
\[ y^2 = x + 3 \] and \[ y^2 = -x + 1 \].

2) (5 pts) Find the volume of the solid generated by revolving the region enclosed by the triangle with vertices \((-1,0), (-2,2), \text{ and } (-1,2)\) about the y-axis.

For every \( y \in [0, 9] \),
\[ r(y) = 1, \quad R(y) = \frac{1}{2} (y+2) \]
\[ V = \int_0^9 \pi \left( R(y)^2 - r(y)^2 \right) \, dy \]
\[ = \pi \int_0^9 \left( \frac{1}{4} (y+2)^2 - 1 \right) \, dy \]
\[ = \pi \left[ \frac{1}{4} \left( \frac{1}{3} y^3 + 2y^2 \right) \right]_0^9 \]
\[ = \frac{5}{3} \pi \]

The segment \((-1,0) \text{ to } (-2,2)\) has equation: \( y = -2x - 2 \)
1.) Evaluate the area of the region enclosed by the parabolas \( x^2 = y + 3 \) and \( x^2 = -y + 1 \).

\[
\begin{align*}
\text{Area} &= \int_{-\sqrt{2}}^{\sqrt{2}} \left[ x^2 + (x^2 - 3) \right] \, dx \\
&= 2 \int_{0}^{\sqrt{2}} (-2x^2 + 4) \, dx \\
&= -4 \left[ \frac{x^3}{3} - 2x \right] \bigg|_{0}^{\sqrt{2}} \\
&= \frac{16}{3} \sqrt{2}
\end{align*}
\]

2.) The base of a solid is bounded by the curves \( y = \sqrt{x} \), \( y = 0 \), and \( x = 1 \). If the cross-section perpendicular to the x-axis are circles, then find the volume of the solid.

For every \( x \in [0, 1] \), \( A(x) \) is a disk of radius \( \sqrt{x} \) with area \( A(x) = \pi \left( \frac{x}{2} \right)^2 = \pi \frac{x^2}{4} \).

\[
\begin{align*}
V &= \int_{0}^{1} A(x) \, dx \\
&= \int_{0}^{1} \pi \frac{x^2}{4} \, dx \\
&= \frac{\pi}{8} \left[ \frac{x^3}{3} \right]_0^1 \\
&= \frac{\pi}{8}
\end{align*}
\]