Cylindrical shell method to find volume

Rotate the region bounded by \( y = x \) and \( y = 5x - x^2 \) about \( x = 8 \). Use cylindrical shell method to set up the integral to find the volume of the solid of revolution.

\[
x = 5x - x^2
\]
\[
x^2 - 4x = 0
\]
\[
x(x - 4) = 0
\]
\[
x = 0 \quad x = 4
\]

\[
V_i = 2\pi r_i h_i \Delta x = 2\pi (8-x_i)(5-x-x^2) \Delta x
\]

\[
V \approx \sum_{i=1}^{4} 2\pi (8-x_i)(-x_i^2 + 4x_i) \Delta x
\]

\[
V = \int_{0}^{8} 2\pi (8-x)(4x-x^2) dx
\]