1. Find the exact length of the curve.

\[ y = \sqrt{x - x^2} + \sin^{-1}(\sqrt{x}) \]
2. Find the area of the surface obtained by rotating \( x = \frac{1}{3}(y^2 + 2)^{3/2} \), \( 1 \leq y \leq 2 \) about the \( x \)-axis.
3. Determine whether the sequence \( a_n = n - \sqrt{n + 1} \sqrt{n + 3} \) converges or diverges. If it converges, find the limit.
4. Determine whether the series $\sum_{n=1}^{\infty} \left( e^{1/n} - e^{1/(n+1)} \right)$ is convergent or divergent. If it is convergent, find its sum.
5. Express the number $10.13\overline{5}$ as a ratio of integers