A. The area bounded by $y = 4, y = x^2$, and $y = 0$ is rotated about the $y$-axis. Find the volume of the resulting solid.

B. The area bounded by $x = 5, x = e, y = 1$, and $y = \ln x$ is rotated about the $x$-axis. Find the volume of the resulting solid.

C. Find the limits:
   a. $\lim_{x \to \infty} \frac{e^x}{e^x + 1}$
   b. $\lim_{x \to \infty} \sqrt{x + 2} - \sqrt{x}$
   c. $\lim_{x \to 0} \frac{\ln x}{x}$

D. $\int_0^\infty \frac{1}{x^2 + 3x + 2} \, dx$

E. $\int_0^2 \frac{1}{\sqrt{4-x^2}} \, dx$

F. $\int_1^\infty \frac{1}{x^p} \, dx$