1. (1 point) Simplify the following quantity.

\[ 15e^{2\ln(\sqrt{3}/3)} \]

2. (3 points) Carefully sketch a graph of the following function. You should clearly label the value of any x-intercepts, y-intercepts, or asymptotes.

\[ y = 4 - 12e^{-x} \]
3. (3 points) Determine all values of $x$ which satisfy the equation below.

$$\ln (x + 5) + \ln (x + 7) = \ln (3)$$

4. (3 points) The function $w(x) = \frac{4}{5 + 3e^{2x}}$ is one-to-one on its domain. Determine a formula for its inverse $w^{-1}(x)$. 