Handout 17: 3.10 (Logarithms)

1. For each of the functions below:
   - i. Find the inverse of $f(x)$.
   - ii. Find the domain and range of $f(x)$.
   - iii. Find the domain and range of $f^{-1}(x)$.

   a. $3\log_{\frac{1}{2}}(x - 2) + 5$

   b. $5e^{2x+4} - 7$

   c. $\frac{1}{2}\log x - 3$

2. Determine the domains of the following functions, using a sign chart as necessary.
   a. $\log_7\big((x + 5)(x - 2)\big)$
   b. $\log_3\big((4 - x)(x + 3)\big)$
   c. $\log\left(\frac{x}{x+2}\right)$
   d. $\ln(7^x)$

3. Are $\log\left(\frac{x}{x+2}\right)$ and $\log(x) - \log(x + 2)$ identical functions?