

7.5 Inverses of Logarithmic Functions Notes

To find the inverse of a logarithmic function, follow these steps:

1. Change $f(x)$ to y
2. Switch the x and y 's
3. Solve for y by isolating the log/ln/exponent term
4. Once the log/ln/exponent term is isolated, use the following properties to further solve for y

$$b^{\log_b x} = x$$

$$e^{\ln x} = x$$

$$\log_b x = c \text{ if and only if } b^c = x$$

$$\ln x = c \text{ if and only if } e^c = x$$

5. Continue to isolate the y
6. When the y is solved for, switch y back to $f^{-1}(x)$

Examples: Find the inverse of each function

1. $f(x) = \log_3(2x+1) + 5$

2. $f(x) = \ln(x+2) - 3$

3. $f(x) = 5^{x-6} + 1$

4. $f(x) = 5 \cdot 2^{3-x} - 4$

5. $f(x) = e^{4x-5} - 7$