Exponential and Log Functions Worksheet

Exponential Functions and Inverse of a Function

1. Find the inverse of \( f(x) = 2x - 3 \)

2. Find the inverse of \( g(x) = \frac{x - 4}{x - 2} \)

Mini Lecture: If \( f(x) = 3^x \) and \( g(x) = \left(\frac{1}{2}\right)^x \) find,

a. \( g(0) \)

b. \( f(-3) \)

c. \( f(2) + g(-2) \)

d. Graph \( y = 2^x \)

e. Graph \( y = 3^x \) and its inverse

3. Graph \( y = x^2 - 2 \) and find its inverse and graph it.

Properties of Logarithms

1. Expand \( \log_3 \left(\frac{3xy}{z}\right) \)

2. Expand \( \log_2 \left(\frac{x^4}{\sqrt{y \cdot z^3}}\right) \)
3. Simplify \(2 \log_{10} a + 3 \log_{10} b - \frac{1}{3} \log_{10} c\)

**Common Logs and Natural Logs**

1. Find \(\log 2,760\)

2. Find \(\log 0.0391\)

3. Solve \(\log x = -2.4179\)

4. Simplify.
   a. \(e^0\)  
   b. \(e^1\)  
   c. \(\ln e\)  
   d. \(\ln 1\)
   e. \(\ln e^3\)  
   f. \(\ln e^{-1}\)  
   g. \(\ln e^t\)

5. If \(\ln 2 = 0.6931\) and \(\ln 3 = 1.0986\), find
   a. \(\ln 6\)  
   b. \(\ln 0.5\)  
   c. \(\ln 8\)

**Equations Containing Logs**

1. Solve \(\log_3 x = -2\)
2. Solve \( \log_4 x = 3 \)

3. Solve \( \log_2 (x + 2) + \log_2 x = 3 \)

4. Solve \( \log_8 4 = x \)

**Graphing Exponential and Logarithmic Functions**

1. Sketch the graph of the exponential function \( y = 2^x \)

2. Sketch the graph of \( y = \left( \frac{1}{3} \right)^x \)

3. Graph \( y = 2^x \) and its inverse \( x = 2^y \)

4. Graph \( y = \log_2 x \)