Answer the questions in the spaces provided. **Show all of your work and circle the answer you would like to have graded for each question.**

Name and section:_____

1. Given $f(x) = \log_3 x$, compute $f^{-1}(2)$.

2. Use the properties of logarithms to condense the following expression to the logarithm of a single quantity:
$$3\log_3 x + \frac{1}{4}\log_3 y - 4\log_3 z.$$

3. Solve the following equation algebraically (solutions must be exact):
$$x\ln\left(\frac{1}{x}\right) - x = 0, \quad x \neq 0.$$