Name: _____   Student #:_____

Date:_____   T.A. #:_____

Mathematics 12 Pre-Calculus
LEARNING GUIDE 14 TEST – LOGARITHMS

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GRAPHING CALCULATORS ARE NOT PERMITTED ON THIS TEST.
***Full marks will NOT be given for the final answer only.**

When using a calculator, you should provide a decimal answer that is correct **to at least two decimal places** (unless otherwise indicated). Such rounding should occur **only** in the final step of the solution.

1. Determine the equation of the inverse of the function $y = 2^x$. (1 mark)

2. Express $\log_2(1/8) = -3$ in exponential form. (1 mark)
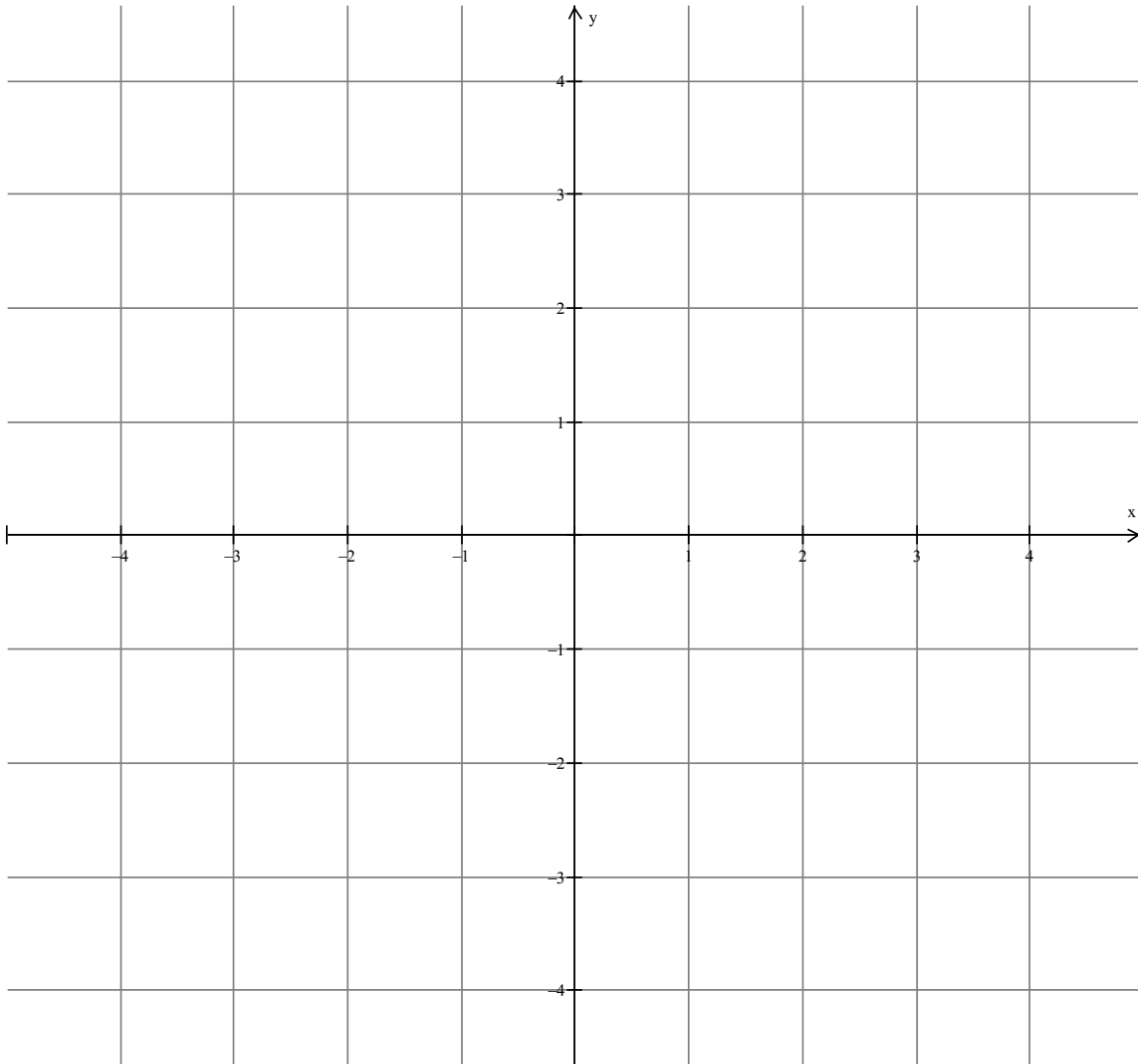
3. Evaluate. (1 mark each)

   a) log 100

   b) $\log_2 \frac{1}{4}$

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4. Given the function $f(x) = 2\log_2 x - 1$.

    a) Sketch the graph of $f(x)$. (2 marks)
    b) Determine the domain and range of the function. (1 mark)
    c) Determine the equation of the asymptote. (1 mark)

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5. Determine the equation of the asymptote of the function $f(x) = a \log_b x - d$ if a, b, d are positive real numbers. (1 mark)

6. Simplify $\log_3 \sqrt{27}$. (1 mark)

7. Write as a single logarithm: log 8 + log 3 – log 6. (1 mark)

8. Write ½log$c$ – 2log$d$ + 3log$f$ as a single logarithm. (1 mark)

9. If log 8 = a and log 7 = b, write $\log \frac{8}{49}$ as an expression in terms of a and b. (2 marks)

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10. Solve each equation algebraically. (1 mark each)

a) $\log x = 0.8$

b) $\log_4 x = -3$

11. Solve each equation algebraically. (2 marks each)

a) $4^x = 3^{x+1}$

b) $2(18)^x = 3^{x+1}$

12. Solve algebraically (2 marks each)

    a) $\log_4(x-4) + \log_4 x = \log_4 5$

    b) $2 \log_3(x + 4) - \log_3(-x) = 2$

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