LG 14 Ver B

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 $y = \frac{1}{2}^{x}$. (1 mark)

2. Express $3^{x} = \frac{1}{2}$ in logarithmic form. (1 mark)

3. Evaluate. (1 mark each)

   a) log 8

   b) $\log_3 7$

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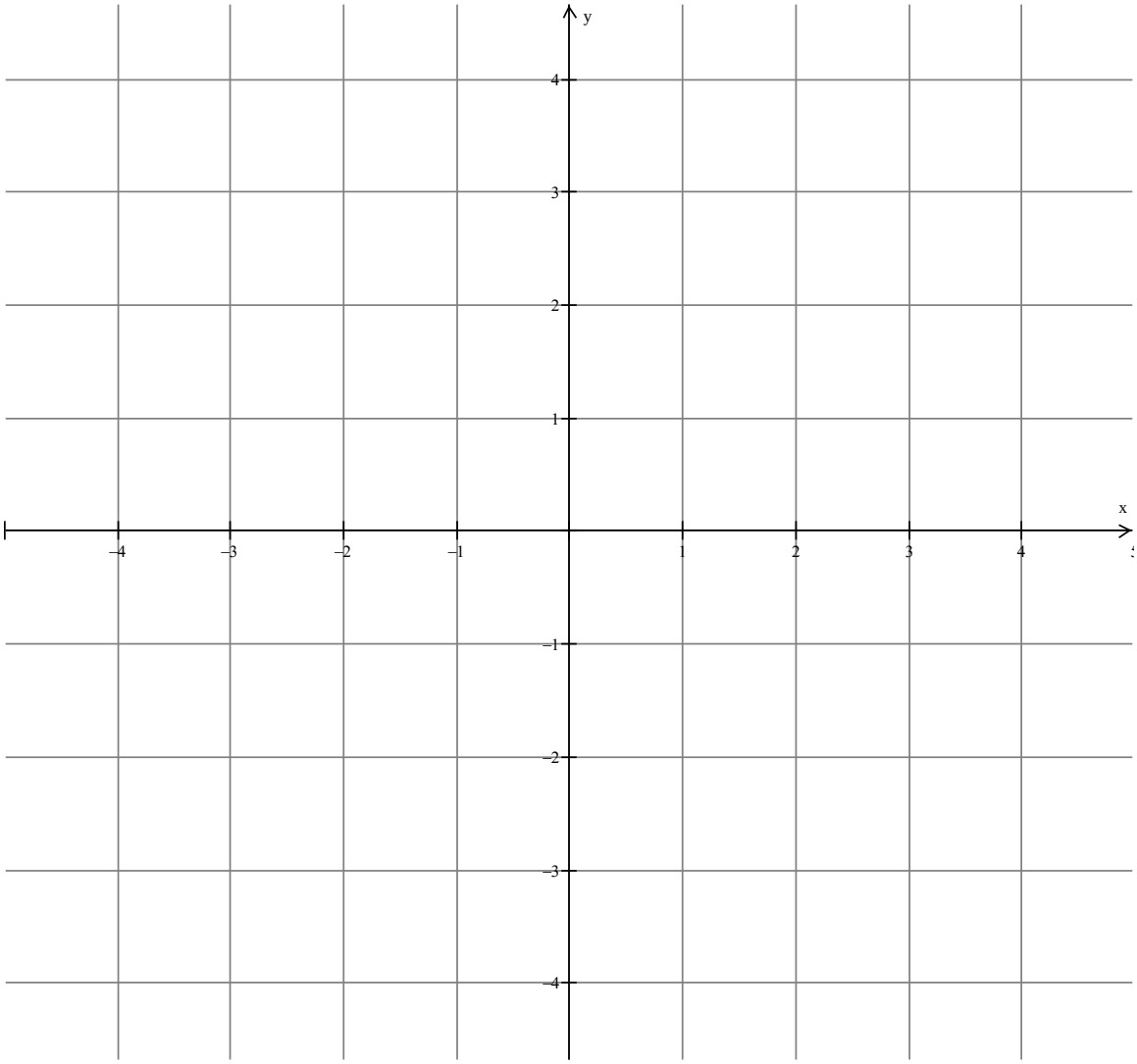
4. Given the function $f(x) = -\log_2(x-1)$.

   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 $\log_2 \sqrt{8}$. (1 mark)

7. Write as a single logarithm: log 10 - log 5 + log 3. (1 mark)

8. Write $2\log_3 2 + \log_3 5 - \frac{1}{2}\log_3 16$ as a single logarithm. (1 mark)

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

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

a) $\log x = 0.5$

b) $\log_x 4 = 2$

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

a) $7^x = 2^{x-1}$

b) $2(8)^x = 5^{x+1}$

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12. Solve algebraically (2 marks each)

a) $\log_3(x-6) + \log_3(x-8) = \log_3 24$

b) $2\log_4(x+4) - \log_4(x+12) = 1$

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