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24		7		11		6 + 2		50
K / U		*TIPS*		*App*		*Comm*		

Name: _____ Date: _____

MHF4U

Unit 7 – Exponential and Logarithmic Functions

Knowledge/Understanding

1. For the following questions , fill in the blanks with the correct answer. (1 mark each)

a) What is the domain of $y = \log_2 x$? _____

b) State the x-intercept for $y = \log_5 x - 4$. _____

c) Determine the equation of the inverse of $y = \log_3 x$ _____

d) Express $\sqrt[4]{625} = 5$ in logarithmic form. _____

e) Solve for x: $\log_x 81 = 4$ _____

f) Find the value of $\log_2\left(\frac{1}{32}\right)$. _____

g) Find the value of $5^{\log_5 25}$. _____

h) Express $\log 8 + \log 5 - \log 2$ as a single logarithm. _____

2. Solve for x. (4 marks)

a) $5^{2-x} = \frac{1}{125}$

b) $\log(3x + 1) = 5$

3. Solve $\log_5(2x+1)+\log_5(x-1)=1$. (5 marks)

4. Write $\frac{1}{4}\left[2(\log_2 x+3\log_2 y)-3\log_2 z\right]$ as a single logarithm. (3 marks)

5. Solve for x in $6^{x+3}-6^x=215$ (4 marks)

Thinking/Inquiry/Problem Solving

6. Solve $5^{2x} - 4\left(5^{x}\right) = 12$. Round to two decimal places. (4 marks)

7. Determine the point(s) of intersection for the graphs $y = 2(3^{x})$ and $y = 6(2^{x})$. Round your answer to two decimal places. (3 marks)

Application

8. Graph the function $y = \log_{3}(x-1) + 2$ and it's inverse on the same graph. Use graph paper. Draw and label all asymptotes. State the equation of the inverse. (5 marks)

9. An earthquake was first felt in Seattle, Washington and measured 6.8 on the Richter scale. The same earthquake was later recorded in Vancouver with a level of 5.6 on the same scale. How much more intense was this earthquake when it was first felt in Seattle? (3 marks)

10. The half life of radium is 1620 years. If a laboratory has 14 grams of radium, how long will it day before it has 8 grams left. Give the answer to the nearest day. (Remember $M = M_o\left(\frac{1}{2}\right)^{\frac{t}{h}}$ is the equation for exponential decay.) (3 marks)

Communication

11. Point (4,1) is a point on the graph $y = \log_4 x$. Andrew determines that after applying the following transformations $y = -2\log_4[0.5(x-2)]-4$ the resulting point is now (10, -6). Explain how Andrew determined this. (6 marks)