MHF4U Unit 7 Exponential and Logarithmic Functions

Date: _____ /44 Name: _____

1 Complete the chart:

Exponential Form	Logarithmic Form
(a) $4^{6.5} = 8192$	
(b)	$\log_k m = p$

[2]

2 Evaluate each of the following:

(a) $\log_3 27$ _____

(b) $\log_2 \frac{1}{16}$ _____

(c) $\log_5 \sqrt[3]{25}$ _____

[8]

(d) $\log_{2.5} 1$ _____

(e) $\log_7 0$ _____

(f) $10^{\log 5.12}$ _____

(g) $3^{2\log_3 6}$ _____

(h) $\log_7 4$ (to 4 decimal places) _____

3. Express as a single log:

$$2\log_5 3 - \log_5 15 + \log_5 20$$

[2]

4. Evaluate: $2\log_2 3 - \log_2 6 - \log_2 12$

[3]

5. Solve x, $x \varepsilon R$:

(a) $\log_x 16 = \frac{4}{5}$

(b) $\log_9 3\sqrt{3} = x$

[2]

(c) $45 = 3.5(2.4)^{3x}$. Correct answer to 4 decimal places.

[3]

(d) $5^{x+3} = 8^{x-3}$. Correct answer to 4 decimal places

[3]

(e) $\log_3(x-5) + \log_3(x-3) = 1$

[4]

6. (a) Determine the mapping rule that would transform the graph of $y = 5^x$ onto the graph of $y = -2(5)^{\frac{1}{2}x-1} + 3$.

[2] $(x, y) \rightarrow$ _____

(b) For $y = -2(5)^{\frac{1}{2}x-1} + 3$, state :

i. the domain _____

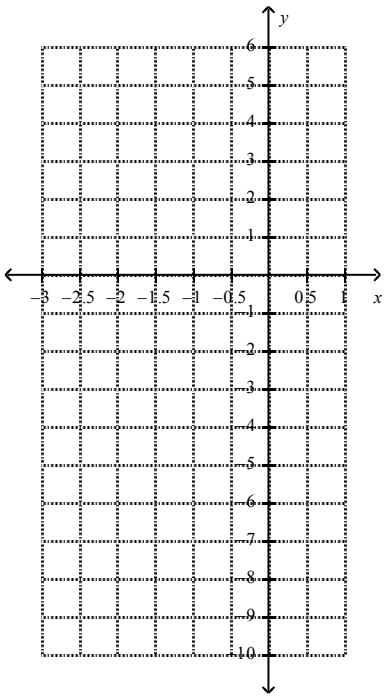
[3]

ii. the range _____

iii. the equation of any asymptote _____

7 Graph $y = 3\log_2(2x + 4) - 2$ by determining the mapping rule that maps $y = \log_2 x$ onto $y = 3\log_2(2x + 4) - 2$ and use points generated by using the rule. Include also the asymptote and its equation on the graph.

[6]



8. The amount of a certain medication decreases by 16% per hour in the bloodstream. A patient was injected 100 ml of the medication at 8:00 a.m.

(a) Write an equation to determine the amount of the medication in the bloodstream t hours after it was administered. Include proper "Let …" statements to introduce your variable.

[2]

(b) At 4:00 p.m. of the same day the patient will be administered a second dosage of the medication. How much of the first dosage is left in the bloodstream at 4:00 p.m.?

[1]

(c) At what time, between 8:00 a.m. and 4:00 p.m. would the amount of the medication from the first dosage be half of what was administered ? Correct your answer to the nearest minute.

[3]