MHF4U Task – Exponentials – Logarithms Name:

1. Solve for the given unknown, round to two decimal places where appropriate: (6 marks)

(a) $5^x = 100$ (b) $1000 = 2^z$ (c) $2^{2x+5} = 1$

2. Solve the following logarithms (10 marks)

(a) $\log_2 64 = x$ (b) $\log_5 125 = x$

(c) $\log_2 100 = x$ (d) $\log_x 121 = 2$

(c) $\log_3 81 + \log_2 16 = x$ (d) $\log_2 \sqrt{16} - \log_5 \sqrt[3]{5} = x$

3. Solve for the given unknown: (5 marks)

(a) $2(3^{x+2}) = 54$ (b) $-3(5^{x+3}) + 86 = 50$

Formula $A_f = A_i(1+i)^n$ $A_f = A_i(\frac{1}{2})^n$

$\log_a m + \log_a n = \log_a mn$ $\log_a m - \log_a n = \log_a(\frac{m}{n})$ $\log_a m^n = n\log_a m$ $\log_a \sqrt[n]{m} = \frac{1}{n}\log_a m$

4. How many years will it take for a $400 investment to grow to $1000 with an interest rate of 12%/a compounded monthly? (3 marks)

5. A radioactive isotope has a half-life of 432 years, determine how long it takes for a sample to degrade to 34% of its original mass. (3 marks)

6. Solve for *x*: (3 marks) - Challenge Problem (you have to dig deep for this one)

$5^{2x} - 4(5^x) = 12.$

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