

Name: _____ Original Score: _____ / 32 marks → _____ % → ISM: _____ → IB: _____
Date: _____ Block: _____ After Corrections: _____ / 32 marks

MATH HONORS 2: UNIT 4 QUIZ 2 – Exponentials and Logarithms

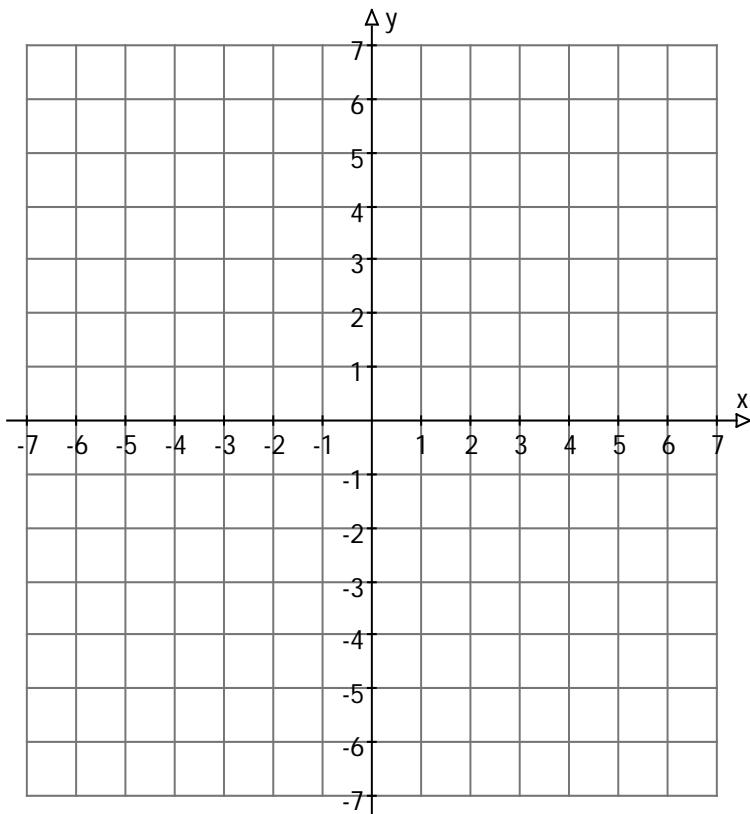
SECTION A: Calculator Inactive – 23 minutes

1. Solve the following equations for x :

a. $27^{3-x} = \left(\frac{1}{9}\right)^{3x+5}$ **(3M)** b. $\log_5 x = 3 \log_5 2 - \log_5 (x-2)$ **(5M)**

2. The x -coordinate of the intersection between two functions $f(x) = 4^x$ and $g(x) = 3^{x-5}$ can be **(5M)**
expressed in the form $x = \frac{\ln a}{\ln c - \ln b}$, where $a, b, c \in \mathbb{N}$. Find a, b , and c .

3. Sketch the graph of $h(x) = -e^{0.25x} + 1$ on the axes below, clearly labeling any intercepts with coordinates and any asymptotes with equations. (4M)



4. Give the domain of the function $f(x) = \log_{3-x} \left(\frac{1}{\ln(x-1)} \right)$. (2M)

5. A logarithmic decay function $f(x) = a \log_2(x+b)$ has a vertical asymptote of $x = 4$, has an x -intercept at $(5, 0)$, and passes through the point $(8, 6)$. Find a and b . (3M)

SECTION B: Calculator Active – 10 minutes

6. A scientist discovers that she has created A_0 grams of a new radioactive substance that she calls Santowskium. She notes that it is continuously decaying according to the equation $A(t) = A_0 e^{-0.01186t}$, where $A(t)$ represents the mass of the Santowskium after t years. How many years will it take for the Santowskium to decay to half of its original mass? **(3M)**
7. On January 1st 2010, Mrs. Brown deposits €320 in a savings bond that has an annual interest rate of 8% pa. and is compounded monthly on the 1st day of each subsequent month. She wants to take a vacation in Jamaica, but cannot book her ticket until the value of her savings bond exceeds €250. In what month (and year) can Mrs. Brown book her ticket to Jamaica? **(5M)**

STUDENT SELF-EVALUATION

After the time allocated for writing this assessment has passed (or if you have finished early), answer the following questions:

- a. Estimate the letter grade that you achieved on this assessment (e.g. A-, C+, etc.): _____

- b. Which concepts did you have the most difficulty with during this assessment and/or this unit?

TEACHER COMMENTS

In every formal assessment this year, 2 marks, 1 mark, or 0 marks will be awarded for the clarity of your communication in the presentation of your solutions and your written explanations.

On this assessment, you were awarded: _____ / 2 marks for communication.

Additional comments: