



# SEKOLAH BUKIT SION

AY 2021-2022

ADDITIONAL MATHEMATICS 0606

## CHAPTER TEST: LOGARITHM

NAME: \_\_\_\_\_ CLASS: \_\_\_\_\_ DATE: \_\_\_\_\_

**Answer all the questions. Show necessary working.**  
**Marks may be deducted if necessary working is not shown.**

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1. Solve the following simultaneous equations.

(a)  $\log_2(x - 3y + 2) = 0$   
 $\log_2(x + 1) - 1 = 2\log_2 y$

(b)  $y = e^x - 3$   
 $y = 1 - 3e^{-x}$

2. Given the functions:

$f(x) = e^x + 3$        $g(x) = 6 - 3e^{-2x}$        $h(x) = 2 \ln(2x + 3), x > -1 \frac{1}{2}$

Find

(a)  $f^{-1}(x)$  and its domain

(b)  $g^{-1}(x)$  and its domain

(c)  $h^{-1}(x)$ , its domain and range

3. Use the logarithmic rules to write down as logarithmic equations in base 10.

(a)  $y = a^2b$

(b)  $P = \frac{20e}{\sqrt{n}}$

4. Write the following in index form.

(a)  $\log_2 A = \log_2 b + 2\log_2 c$

(b)  $\ln M = 3\ln a - 2$

5. Solve the following:

(a)  $\log_4 x^3 + \log_2 \sqrt{x} = 8$

(d)  $e^{2x+1} = 11$

(b)  $8(9^x) - 3^x = 0$

(e)  $3^{2x+1} = 4^x$

(c)  $\log_{49} [\log_2 (5x - 2)] = \frac{1}{2}$

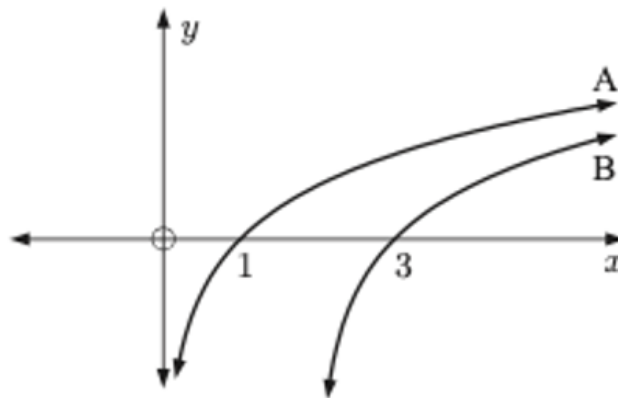
(f)  $\log_t (t - 2) + \log_t (t + 5) = 2$

6. Consider the graphs  $A$  and  $B$ .

One of them is the graph of  $y = \ln x$  and the other is the graph of  $y = \ln(x - 2)$ .

(a) Identify which is which. Give evidence for your answer.

(b) Write down the vertical asymptote for each graph.



7. Given that  $f(x) = e^{2x}$  and  $g(x) = 2x - 1$ , find:

(a)  $f^{-1}g(x)$

(b)  $(gf)^{-1}(x)$

8. The weight,  $W$ , of bacteria in a culture  $t$  hours after establishment is given by  $W = 20 \times e^{0.15t}$  grams. Find, using logarithms, the time for the weight of the culture to reach 100 grams.

9. Thalya has \$10 000 to invest in an account that pays 4.8% per annum compounded annually. How long will it take for his investment to grow to \$15 000?