

Math

Pre-Calculus 12

Exp & Logs

Name: _____

May 2020

A. Multiple Choice: (5 marks)

1.) Identify the range of the function, $y = 5(6^{x-4})$.

- a.) $y \in \mathbb{R}$ b.) $y > 0$ c.) $y > 5$ d.) $y > 4$

2.) Identify the value that cannot be written as a power of 2.

- a.) $\sqrt{32}$ b.) $\frac{1}{4}$ c.) 1 d.) 6

3.) Identify the solution of the equation, $8\left(4^{\frac{1}{3}}\right) = \left(\frac{1}{4}\right)^x$.

- a.) $x = -\frac{11}{6}$ b.) $x = -1$ c.) $x = -\frac{2}{3}$ d.) $x = \frac{7}{3}$

4.) Identify the correct statement if $a^b = c$.

- a.) $\log_a b = c$ b.) $\log_b a = c$ c.) $\log_a c = b$ d.) $\log_b c = a$

5.) Identify the value of x for which $y = \log_3 x$ is not defined.

- a.) $x = 9$ b.) $x = 1$ c.) $x = \frac{1}{3}$ d.) $x = -3$

B. Short Answer: (5 marks)

- 1.) Evaluate. $\log_2 48 - \log_2 6$

- 2.) Write as a single logarithm. $\log(x + 1) + \log(2x - 1)$

- 3.) State the value of the y-intercept of $y = 2^x - 3$.

- 4.) Express $\log_m n = p$ in exponential form.

- 5.) Evaluate. $\log_2(\log_4 16)$

C. Long Answer Show all work for full marks!!

- 1.) Solve for x , without a calculator.

(2)

$$\left(\frac{1}{9}\right)^{x-6} = 27^{2x-1}$$

- 2.) Solve for x , without a calculator.

(2)

$$\log_6(x + 3) + 2 = 5$$

3.) Solve for x .

(3)

$$e^{x-1} = 3^{2x+5}$$

4.) Solve for x , algebraically.

(4)

$$\log_6(x - 3) + \log_6(x + 6) = 2$$

5.) Solve for x , algebraically.

(4)

$$2(6)^{x+2} = 3^{2x-3}$$

6.) Evaluate.

$$\log_3 56$$

(1)

7.) A strain of bacteria doubles every 4 hours. (Use the formula, $A = Pe^{rt}$, where A is the final amount, P is the original amount, r is the rate of growth, and t is the time in hours.)

a.) Determine the rate of growth of this strain of bacteria.

(2)

b.) If a sample contains 40 bacteria, determine how many bacteria are present after 17 hours.

(1)

- 8.) In 1949, Vancouver Island experienced an earthquake with a magnitude of 8.1.
(Use the formula $M = \log \frac{I}{S}$ where M is the magnitude, I is the intensity of the ground motion and S is the intensity of a standard earthquake.)

Calculate the intensity of the earthquake in Vancouver in terms of a standard earthquake.

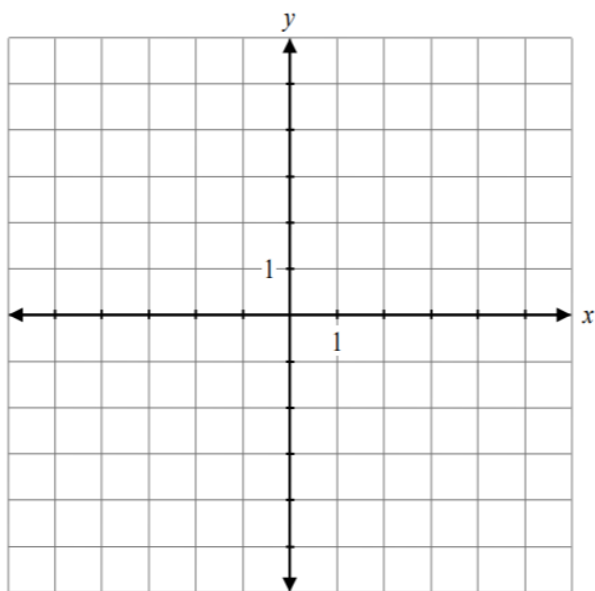
(2)

- 9.) An investment of \$600 earns interest at an annual rate of 5.5%, compounded semi-annually. Determine how long will it take, in years, for the investment to reach an amount of \$1500.

(3) (Use the formula $A = P \left(1 + \frac{r}{n}\right)^{nt}$ where A is the accumulated amount, P is the amount invested, r is the annual rate of increase as a percent, n is the number of compounding periods per year and t is the time in years.)

10.) Sketch the graph of $y = 2^{x-3} + 1$.

(3)



11.) Sketch the graph of $y = -\log_3 x$.

(2)

