EXPONENTIAL & LOGARITHMIC FUNCTIONS ASSIGNMENT

Due Date: _____

Part A Non-calculator

Question 1

Solve for '*x*' in the following equations:

a) $5^{2x} \times 25^{x-1} = 625$

b) $3^{x-1} = \sqrt[3]{27}$

Question 2

Without using a calculator simplify and evaluate where possible:

a) $\log_7 8 + \log_7 9 =$

b) $\frac{1}{2}\log_{10} 16 + 2\log_{10} 5 =$

c) $\log_2 128 + \log_3 45 - \log_3 5 =$

Question 3

Solve for '*x*':

a) $\log_2 64 = x$

b) $\log_x 4 = \frac{1}{3}$

c) $\log_{10} 2 + \log_{10} 5 + \log_{10} x - \log_{10} 3 = 2$

Question 4

Let $\log_{10} P = x$, $\log_{10} Q = y$ and $\log_{10} R = z$.

Express $\log_{10}\left(\frac{P}{QR^3}\right)^2$ in terms of *x*, *y* and *z*.

Question 5

Solve $\log_{16} \sqrt[3]{100 - x^2} = \frac{1}{2}$.

Question 6

Sketch the graph of $y = -3^x + 6$. State the axes intercepts and the equation of the asymptote.

Question 7

Find $f^{-1}(x)$ given:

a) $f(x) = 4^{2x} - 3$

b) $f(x) = \log_{10}(x+1) - 2$

Part B With a calculator

Question 8

a) Solve for '*x*' correct to 2 decimal places $3^{x-1} = 4$

b) Solve $2^{1-x} \le 5$.

Question 9

The population of a species of wallaby found in the reserve is increasing according to the following model $W = 150 \times 1.08^t$, where W is the number of wallabies t years after the records were first kept.

a) Find the initial population.
b) Find the population 1 year and five years after the records were first kept. Give answers to the nearest whole number.
c) Plot a graph of W against t.
d) Use the graph to find the size of the population after 15 years.
e) How long would it take for the population to double? Give your answer to the nearest.