LOGARITHMS

QUESTION 1

Convert each of the following to logarithmic form.

(a) $x^{2y}=4$ **(b)** $5^{x}=12$ **(c)** $(4x)^{5-p}=a$

QUESTION 2

Solve each of the following equations.

(a) $\ln 4x=5$ **(b)** $\log_x 16=4$

(c) $\ln(3x)=6$ **(d)** $\log_k 81=2$

QUESTION 3

Simplify $\lg_6 2+\lg_6 3$ if possible.

QUESTION 4

Simplify $\log_5 25-\log_5 5$ if possible.

QUESTION 5

Evaluate each of the following without using the calculator.

(a) $\log_8 64$ **(b)** $\log_2\sqrt{4}+\log_2\sqrt{3}-\log_2\sqrt{6}$

QUESTION 6

(a) Given that $p=\log_a 9$, find $\log_3 a$ in terms of p.

(b) If $p=\lg 14$, $\log_{14} 1\frac{2}{5}$ in terms of p.

QUESTION 7

Solve the simultaneous equations.

$$\log_4 x-\log_2 y=2$$

$$3^{x}=81\left(9^{\frac{3}{2}-3y}\right)$$

QUESTION 8

The mass, m grams, of a radioactive substance, present at time t days after first being observed, is given by the formula $m = 28e^{-0.00072t}$.

(a) Find the value of m when $t = 20$.

(b) Find the value of t when the mass is half of its value at $t = 0$.

(c) State the value which m approaches as t becomes very large.

(d) Sketch the graph of m against t.