LOGS & EXPONENTIALS **SET 2**

1 Find the values of:

(a) $\log_9 81$ (b) $\log_6 6$ (c) $\log_3 1$ (d) $\log_2 ¼$ (e) $\log_{81} 9$

(f) $\log_2 16 - \log_2 4$ (g) $2\log_{10} 5 + 2\log_{10} 2$ (h) $\frac{1}{2}\log_2 16 - \frac{1}{3}\log_2 8$

2 Solve for x, round your answers to 2 decimal places.

(a) $3^x = 7$ (b) $8^x = 5$ (c) $\ln(x) + \ln(4x) - \ln(2x) = 1$

3 Given $\log_a 8 + \log_a 4 - \log_a 2 = 2$, find a.

4 (a) The variables x and y are connected by a relationship of the form $y = ax^n$, where a and n are constants.

Show that there is a linear relationship between $\log_{10} y$ and $\log_{10} x$.

(b) From an experiment some data was obtained.

The table shows the data which lies on the line of best fit.

x	1	4	9	16
y	4.0	2.0	1.3	1.0

The variables a and n in the above table are connected by a relationship of the form $y = ax^n$.

Determine the values of a and n.

5 The mass of a radioactive element decreases at a rate given by $m_t = m_0 e^{-0.01t}$, where t is the time in years.

Find:

(a) the mass of 250mg of the element after a century,

(b) the half-life of the element.