EXTRA PRACTICE HANDOUT ON LOGARITHMS

1. Solve the following equations giving your answers correct to 3 significant figures where necessary.

a) $2^x \cdot 3^{2x+4} = 7$

b) $-2\log_2(3x) = 4$

c) $5^x = 3^{x+2}$

d) $\log_x 64 = -3$,

e) $\log_x 4 = 2\log_2 x - 3$

f) $9^x - 7 = 2 \cdot 3^{x+1}$

g) $\log_x(x+3) = \log_x(x^2 + 1)$

h) $\log_3(3x+2) - 2\log_3 x = 2$

i) $2\log_3 x - \log_9 x = 4$

2. Write as a single logarithm the following:

a) $\log(x+5) + 2\log x$

b) $\log_a 5 + \dfrac{1}{2}\log_a 16 - \log_a 2$

3. Show that $\log_4 3 = \log_2 \sqrt{3}$.

4. Given that $b = \log_a 2$, express in terms of b:

a) $\log_a 8$

b) $\log_a(16a)$

5. Express in terms of $\log a$, $\log b$ and $\log c$.

    a) $\log\left(ab^2\right)$

    b) $\log\dfrac{c^3}{a}$

    c) $\log\sqrt{\dfrac{a}{c}}$

Answers

1. a) -0.847   **b)** $\dfrac{1}{12}$ **c)** 4.30   **d)** $\dfrac{1}{4}$ **e)** $\dfrac{1}{\sqrt{2}}$ *or* 4   **f)** 1.77   **g)** 2 *or* -1   **i)** 18.4

2. a) $\log x^2\left(x+5\right)$ **b)** $\log_a 10$

3. –

4. a) $3b$ **b)** $4b+1$

5. a) $\log a + 2\log b$ **b)** $3\log c - \log a$ **c)** $\dfrac{1}{2}\log a - \dfrac{1}{2}\log c$