Logs 1 : Answers

48) a) Book Work

b) $\log_a(3x+4) - \log_a x = 3\log_a 2$

$$\log_a\left|\frac{3x+4}{x}\right| = \log_a 2^3$$

$$\frac{3x+4}{x} = 8$$

$$3x+4 = 8x$$

$$4 = 5x$$

$$\frac{4}{5} = x$$

c) $4^{3y+2} = 7$

$$\ln 4^{3y+2} = \ln 7$$

$$(3y+2)\ln 4 = \ln 7$$

$$3y+2 = \frac{\ln 7}{\ln 4}$$

$$3y+2 = 1.404$$

$$3y = -0.5963$$

$$y = -0.199 \quad \text{to 3 d.p.}$$

49) a) Book Work

b) $\log_9 x = -\frac{1}{2}$

$$9^{-1/2} = x$$

$$\frac{1}{\sqrt{9}} = x$$

$$\frac{1}{3} = x$$

c) $\log_a(4x+7) = \log_a x + 2\log_a 3$

$$\log_a(4x+7) = \log_a x + \log_a 3^2$$

$$\log_a(4x+7) = \log_a 9x$$

$$4x+7 = 9x$$

$$7 = 5x$$

$$\frac{7}{5} = x$$

50) a) Book work

b) $3^{5-2x} = 7$

$\ln 3^{5-2x} = \ln 7$

$(5-2x)\ln 3 = \ln 7$

$5-2x = \frac{\ln 7}{\ln 3}$

$5-2x = 1.7712$

$5-1.7712 = 2x$

$3.2288 = 2x$

$1.614 = x$

c) $\log_a(x-3) + \log_a(x+3) = 2\log_a(x-2)$

$\log_a(x-3)(x+3) = \log_a(x-2)^2$

$\log_a(x^2-9) = \log_a(x-2)^2$

$x^2-9 = (x-2)^2$

$x^2-9 = x^2-4x+4$

$4x = 13$

$x = \frac{13}{4}$