Core 2 - Exponentials and Logarithms

Challenge 1

Given that $p = \log_2 3$ and $q = \log_2 5$, find expressions in terms of p and q for

(a) $\log_2 45$, (3)

(b) $\log_2 0.3$ (3)



Challenge 2

- (a) Given that $t = \log_3 x$, find expressions in terms of t for
 - (i) $\log_3 x^2$,

(ii)
$$\log_9 x$$
. (4)

(b) Hence, or otherwise, find to 3 significant figures the value of x such that

$$\log_3 x^2 - \log_9 x = 4. {3}$$



Challenge 3

(a) Evaluate

$$log_3 27 - log_8 4.$$

(b) Solve the equation

$$4^x - 3(2^{x+1}) = 0.$$



(4)

(5)

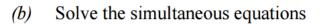
Final Challenge

(a) Given that

$$\log_2(y-1) = 1 + \log_2 x,$$

show that

$$y = 2x + 1$$
.



$$\log_2(y - 1) = 1 + \log_2 x$$

$$2\log_3 y = 2 + \log_3 x$$



(3)

(7)