First Year Maths and Further Maths combined Test A10 Exponentials and logarithms 20 minutes

Throughout the entire test all working must be shown and solutions based entirely on graphical or numerical methods may not be acceptable.

1.	
(a)	Given that $\log_3 c = m$ and $\log_{27} d = n$, express $\frac{\sqrt{c}}{d^2}$ in the form 3^y , where y is an

expression in terms of m and n.

[4 marks]

Show that the equation (b)

$$\log_4(2x+3) + \log_4(2x+15) = 1 + \log_4(14x+5)$$

has only one solution and state its value.

[4 ma	rks]
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2. Fig. 8 shows the graph of $\log_{10} y$ against $\log_{10} x$. It is a straight line passing through the points (2,8) and (0,2).

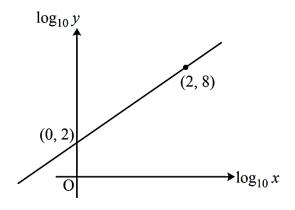


Fig. 8

Find the equation relating $\log_{10} y$ and $\log_{10} x$ and hence find the equation relating y and x. [4]

Solve the equation

$$2^{2x+5} - 7(2^x) = 0$$

giving your answer to 2 decimal places. (Solutions based entirely on graphical or numerical methods are not acceptable.)