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A LEVEL MATHS

(85) Logarithms (Log and Exponential Equations)

WORKING AT D/E

(1) Solve each equation giving your answer to 3.SF
(a) $3^x = 13$ (b) $5^x = 16$ (c) $2^x = 0.91$

(2) Solve each equation giving your answer to 3.SF
(a) $4^{x+1} = 50$ (b) $5^{1-x} = 8$ (c) $7^{2x+1} = 100$

(3) (a) By taking logarithms of both sides of the equation, show that the equation $5^x = 2^{3x-1}$ can be written as $x \log 5 = 3x \log 2 - \log 2$

(b) Hence, solve the equation $5^x = 2^{3x-1}$ giving your answer to 3 significant figures.

WORKING AT B/C

(1) Solve the equation $4^{x+1} = 3^{2x-1}$ giving your answer to 3 significant figures.

(2) (a) Using the substitute $p = 5^x$ show that the equation $5^{2x} + 2(5^x) - 8 = 0$ can be written as $(p + a)(p + b) = 0$ where a and b are constants to be found.

(b) Hence, find the solutions for p.

(c) Using your answer to part (b) find the only solution to the equation $5^{2x} + 2(5^x) - 8 = 0$.

(3) Find the coordinates of the point where the graphs of $y = 2^x$ and $y = 3^{x-1}$ intersect giving your answers to 3 significant figures.

WORKING AT A*/A

(1) Solve the equation $2^{3x-1} = 7 \times 5^{x-3}$ giving your answer to 3 SF.

(2) Solve the equation $6^{2x} - 6^{x+1} + 8 = 0$

(3) Prove that there are no real solutions to the equation $5(2^{2x+1}) + 2^{x+2} + 1 = 0$