Solving Equations & Logs 3ii

A Level

Part A Express log

Express $\log_3(4x + 7) - \log_3 x$ as a single logarithm.

The following symbols may be useful: `ln(), log(), x`

Part B Solve equation

Hence solve the equation $\log_3(4x + 7) - \log_3 x = 2$. Give your answer in decimal form.

Part C Use logs

Use logarithms to solve the equation $7^x = 2^{x+1}$, giving the value of x correct to 3 significant figures.

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Log Laws 2ii

A Level

Part A Express as a single log (i)

Express $\log_a 2 + \log_a 3$ as a single logarithm.

The following symbols may be useful: `a, log()`

Part B Express as a single log (ii)

Express $2\log_{10} x - 3\log_{10} y$ as a single logarithm.

The following symbols may be useful: `log(), x, y`

Used with permission from UCLES, A Level Maths, January 2008, OCR C2, Question 3

Log Laws 1i

A Level

Part A Log laws

Given that $log_a(x) = p$ and $log_a(y) = q$, express $log_a(xy)$ in terms of p and q.

The following symbols may be useful: `p, q`

Part B Simplify 1

Given that $log_a(x) = p$ and $log_a(y) = q$, express $log_a(\frac{a^2x^3}{y})$ in terms of p and q.

The following symbols may be useful: `p, q`

Part C Simplify 2

Express $log_{10}(x^2 - 10) - log_{10}x$ as a single logarithm

The following symbols may be useful: `log(), x`

Part D Solve equation

Solve the equation $log_{10}(x^2 - 10) - log_{10}x = 2log_{10}3$.

Used with permission from UCLES, A Level Maths, January 2009, OCR C2, Question 8

Solving Equations & Logs 3i

A Level

Part A Solve equation

Solve the equation $2^{4x-1} = 3^{5-2x}$, giving your answer in the form $x = \frac{\log_{10} a}{\log_{10} b}$.

The following symbols may be useful: `log(), x`

Part B Find integer

Find the smallest integer n which satisfies the inequality $7^{2n} > e^{600}$.

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Exponential equation 1

A Level Further A

Solve the following for y: $4^y = 8^{y+1}$

Created for isaacphysics.org by Julia Riley.

Exponential equation 3

A Level Further A

Solve the following for m: $\frac{1}{9^m} = 27^{1-m}$.

Created for isaacphysics.org by David Lawrence

Exponential equation 2

A Level Further A

Solve the following for x: $3^x = \dfrac{1}{9^{x-\frac{9}{4}}}$.

Created for isaacphysics.org by David Lawrence

Log Laws 1ii

A Level

Part A Express in terms of $\log_2(x)$ (i)

Express $\log_2(x^2)$ in terms of $\log_2(x)$.

The following symbols may be useful: `ln(), log(), x`

Part B Express in terms of $\log_2(x)$ (ii)

Express $\log_2(8x^2)$ in terms of $\log_2(x)$.

The following symbols may be useful: `ln(), log(), x`

Part C Find $\log_3 y$

Given that $y^2 = 27$, find the value of $\log_3 y$.

The following symbols may be useful: `ln(), log(), y`

Solving Equations & Logs 1ii

A Level

Part A Solve equation (i)

Use logarithms to solve the equation $5^{x-1} = 120$ for x, giving your answer correct to 3 significant figures.

Part B Solve equation (ii)

Solve the equation $\log_2 x + 2\log_2 3 = \log_2(x + 5)$. Give the value of x correct to 3 significant figures.

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Log Laws 1i

A Level

It is given that $\ln x = p + 2$ and $\ln y = 3p$

Part A Log laws

Express $\ln(xy)$ in terms of p.

The following symbols may be useful: p

Part B Simplify 1

Express $\ln(x^3)$ in terms of p.

The following symbols may be useful: p

Part C Simplify 2

Express $\ln(\frac{y}{e})$ in terms of p.

The following symbols may be useful: p

Part D Solve equation

Express y in terms of x and e, simplifying your answer.

The following symbols may be useful: `e, x, y`

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