

Exponential Equation 1

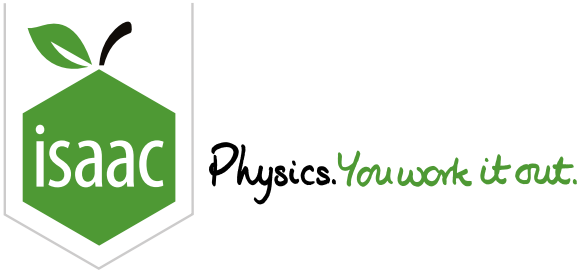
Pre-Uni Maths for Sciences E3.1



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

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Exponential Equation 2

Pre-Uni Maths for Sciences E3.2

A Level
P P P

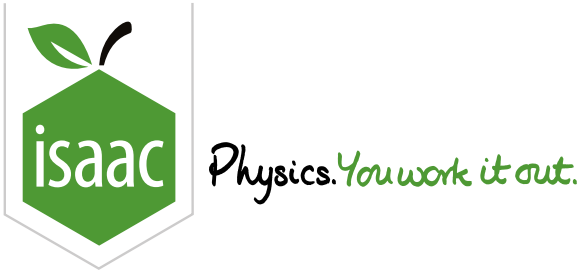
Solve the following for x : $3^x = \frac{1}{9^{x-\frac{9}{4}}}$.

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Exponential Equation 3

Pre-Uni Maths for Sciences E3.3



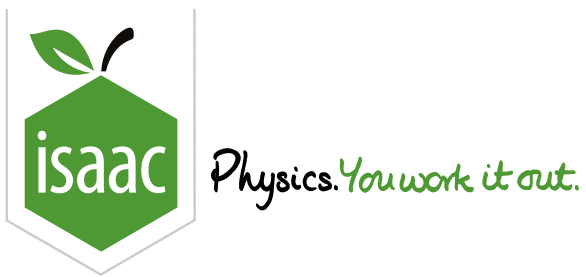
Solve the following for m : $\frac{1}{9^m} = 27^{1-m}$.

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Log Laws 2ii

A Level



Part A Express $\log_a 2 + \log_a 3$

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

Note that $\log_a b$ can be typed as `log(b,a)`.

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

Part B Express $2 \log_{10} x - 3 \log_{10} y$

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

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

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Physics. *You work it out.*

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Log Laws 1ii

A Level
P P P

Part A Express $\log_2(x^2)$

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

When you are entering your answer, note that $\log_a b$ can be written using `log(b,a)`.

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

Part B Express $\log_2(8x^2)$

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

When you are entering your answer, note that $\log_a b$ can be written using `log(b,a)`.

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

Part C Find $\log_3 y$

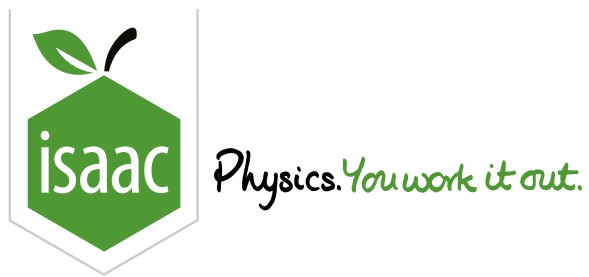
Given that $y^2 = 27$, find the value of $\log_3 y$.

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

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Solving Equations & Logs 1ii



Part A Solve exponential equation

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

Part B Solve logarithmic equation

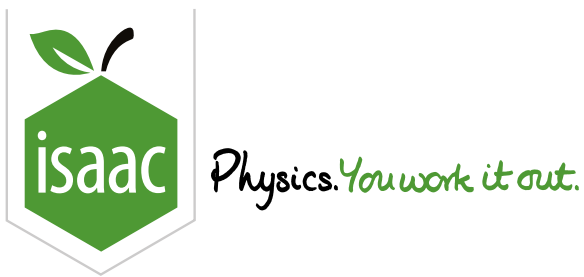
Solve the equation $\log_2 x + 2\log_2 3 = \log_2(x + 5)$. Give the value of x correct to 3 significant figures.

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Solving Equations & Logs 3ii



Part A Express log

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

When you are entering your answer, note that $\log_a b$ can be written using `log(b,a)`.

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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Logarithm Laws

A Level

P

P

P

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 $\log_a\left(\frac{a^2x^3}{y}\right)$ 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.

When you are entering your answer, note that $\log_a b$ can be written using `log(b,a)`.

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

Part D **Solve equation**

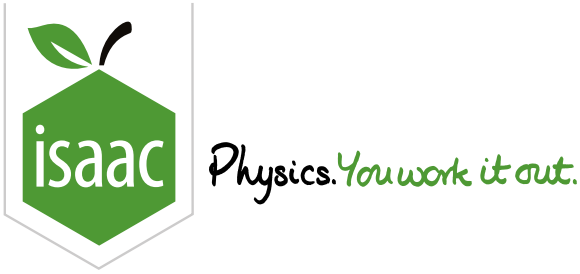
Solve the equation $\log_{10}(x^2 - 10) - \log_{10} x = 2 \log_{10} 3$. Write down the value of x .

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Log Laws 1i



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 $\ln\left(\frac{y}{e}\right)$ 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.

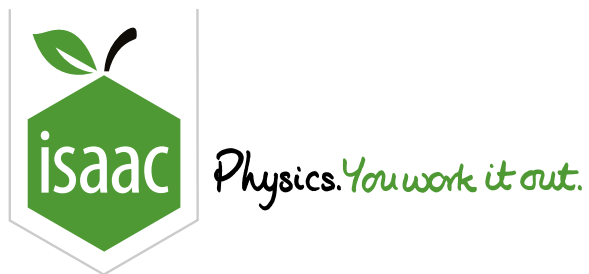
The following symbols may be useful: e , x , y

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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 $\frac{\log_{10} a}{\log_{10} b}$.

When you are entering your answer, note that $\log_a b$ can be written using `log(b,a)`.

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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