How to solve equations of the form

$3^x = 44$

$\log 3^x = \log 44$

$x \log 3 = \log 44$

$x = \log 44 \div \log 3$

combine into one term
log A + log B

log (AB)

combine into one term
log A – log B

$\log \left(\frac{A}{B}\right)$

rewrite in terms of log A

$\log (A^x)$

$x \log A$

rearrange as log ( )
2 log (AB)

$\log (A^2 B^2)$

Formula for exponential growth

Value = Start × (1 + change)^{time}

Formula for exponential decay

Value = Start × (1 – change)^{time}

The equation which generates $\log_b y = x$	$y = b^x$
How to calculate the value of $\log_b C$ if b and C are known values	$\frac{\log_{10} C}{\log_{10} b}$
write as one log term $2 \log X + \log Y$	$\log (X^2 Y)$
write as one log term $\log_b 18 - 2 \log_b 3$	$= \log \left(\frac{18}{3^2}\right)$ $= \log_b 2$
order to apply log rules when simplifying expressions	1) $x \log A = \log (A^x)$ 2) $\log (A) + \log(B) = \log (AB)$ 3) $\log (A) - \log (B) = \log \left(\frac{A}{B}\right)$
Simplify $\frac{2}{a} + \frac{3}{b}$	$= \frac{2b}{ab} + \frac{3a}{ab}$ $= \frac{2b + 3a}{ab}$
Simplify $\frac{3x^2 + x}{5x}$	$= \frac{x(3x + 1)}{x \times 5}$ $= \frac{3x + 1}{5}$

Simplify

$(x^2 + 8x + 16)(x + 4)^{-1}$

$= \frac{(x + 4)\cancel{(x + 4)}}{\cancel{(x + 4)}}$

$= x + 4$

Simplify

$\frac{x^2 + 3x + 2}{x + 1}$

$= \frac{(x + 2)\cancel{(x + 1)}}{\cancel{(x + 1)}}$

$= x + 2$

Write with no negative powers

$\left(\frac{x^2}{2a}\right)^{-1}$

$\frac{2a}{x^2}$

Expand $(4x^3y)^2$

$16x^6y^2$

Simplify

$\sqrt{25x^2y^6}$

$5xy^3$

Write in terms of a power of x

$\sqrt{36x}$

$6x^{½}$

Write with no negative powers

$8x^{-2}$

$\frac{8}{x^2}$