C12 - 8.3 - $\log a^m = m\log a$ Change Base Dist. Notes

$log5^2$ ⇕ $2log5$

$logx^2$ ⇕ $2logx$

$3log4^2$ OR $3log4^2$

$2 \times 3log4$ $6log4$ $log4^{2\times3}$ $log4^6$ $6log4$

Bring Exponent down in front and Vice Versa Multiply

$log\sqrt{x}$ $logx^{\frac{1}{2}}$ $\frac{1}{2}\log x$ ⇕ $\frac{logx}{2}$

$\log\left(\frac{1}{2}\right)$ $log2^{-1}$ $-1log2$ ⇕ $-log2$

$\log_5 5^4 = x$ 5 to what power is 5^4

$5^4 = 5^x$

$x = 4$

$log_5 625 = x$ Change of Base

$\log_5 5^4 = x$ Bring Exponent down in front

$4\log_5 5 = x$ Log Rules

$4 \times 1 = x$

$x = 4$ Solve

$\log_5 5 = 1$

$log_5 625 = x$

$625 = 5^x$

$5^4 = 5^x$

$x = 4$

$logxy^2 =$

$logx + logy^2 =$

$logx + 2logy$

The exponent only applies to the y value

$logx^2y^2 =$ ← $\log(xy)^2 =$

$logx^2 + logy^2 =$ $2logxy =$

$2logx + 2logy$ $2(logx + logy) =$

$2logx + 2logy$

$log3^{x+2}$

$(x + 2)\log 3$

$xlog3 + 2log3$

Bring Exponent in front

Distribute

$3xlog7 - xlog2 =$

$x(3log7 - log2)$

$GCF = x$

Change of Base

$\frac{log16}{log4} =$

$\log_4 16 =$ 2

$\frac{\log_2 16}{log_2 4} =$

$\log_4 16 =$ 2

Exponential Form

$16 = 4^2$

$\log_2 2 = 2$

$\log_2 16 = 4$

$\frac{4}{2} = 2$

$\log_2 4 =$

$\frac{\log_5 4}{\log_5 2}$

Choose the Base you want!

$\log_8 16 =$

$\frac{\log_2 16}{\log_2 8} = \frac{4}{3}$

$\frac{1}{\log_8 2} =$

$\frac{1}{\left(\frac{log2}{log8}\right)} =$

$1 \times \frac{log8}{log2} = \frac{log8}{log2}$

Rule 6

$\log_3 9 + \log_9 2$

$\log_{(3)^2}(9)^2 + \log_9 2$

$\log_9 81 + \log_9 2$

$\log_9 81 \times 2$

$\log_9 162$

Take the base and the log to any exponent you like!