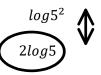
C12 - 8.3 - $\log a^m = m \log a$ Change Base Dist. Notes



 $\begin{array}{c}
log x^2 \\
2log x
\end{array}$

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

Bring Exponent down in front and Vice Versa Multiply

$$\log \sqrt{x}$$

$$\log x^{\frac{1}{2}}$$

$$\frac{1}{2} \log x$$

$$\frac{\log x}{2}$$

$$\log\left(\frac{1}{2}\right)$$

$$\log 2^{-1}$$

$$-1\log 2$$

$$-\log 2$$

$$\log_5 5^4 = x \qquad 5 \text{ to what} \qquad \log_5 625 = x \qquad \text{Change of Base} \\ 5^4 = 5^x \qquad \text{power is } 5^4 \qquad \log_5 5^4 = x \qquad \text{Bring Exponent} \\ 4\log_5 5 = x \qquad \text{down in front} \\ 4 \times 1 = x \qquad \log_5 625 = x \\ 5^4 = 5^x \\ x = 4 \qquad \text{Solve}$$

$$logxy^2 =$$

$$logx + logy^2 =$$

$$logx + 2logy$$

The exponent only applies to the y value

$$\log 3^{x+2}$$

$$(x+2)\log 3$$

$$x\log 3 + 2\log 3$$

Bring Exponent in front

Distribute

$$3xlog7 - xlog2 =$$

$$x(3log7 - log2)$$

GCF = x

Change of Base

$$\frac{\log 16}{\log 4} = \log_4 16 = 2$$

$$\frac{\log_2 16}{\log_2 4} = \log_4 16 = 2$$

Exponential Form $16 = 4^2$

$$\log_2 2 = 2 \qquad \qquad \frac{4}{2} = 2$$

$$\log_2 16 = 4 \qquad \qquad \frac{4}{2} = 2$$

 $\log_2 4 = \frac{\log_5 4}{\log_5 2}$

Choose the Base you want!

$$\frac{\log_8 16}{\log_2 16} = \frac{4}{3}$$

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

$$\frac{1}{(\frac{\log 2}{\log 8})} = \frac{1}{1}$$

$$1 \times \frac{\log 8}{\log 2} = \frac{\log 8}{\log 2}$$

Rule 6

 $log_3 9 + log_9 2$ $log_{(3)^2}(9)^2 + log_9 2$ $log_9 81 + log_9 2$ $log_9 81 \times 2$

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

log₉ 162