

# C12 - 8.5 - De/Log Operation/Equation/Factoring Notes

$$\log 8 = 0.9031$$

$$\log_4 7 = 1.4037$$

Calculator

Math, Alpha, Math

$$\log_5(x+1) = \log_5 7 \quad \text{Delog both sides}$$

~~$$\log_5(x+1) = \log_5 7$$~~

$$x+1 = 7$$

$$x = 6 \quad \checkmark$$

$$\begin{aligned} \log_2(x-2) + \log_2(x+1) &= 2 \\ \log_2(x-2)(x+1) &= 2 \\ \log_2(x^2 - x - 2) &= 2 \\ x^2 - x - 2 &= 2^2 \\ x^2 - x - 2 &= 4 \\ x^2 - x - 6 &= 0 \\ (x-3)(x+2) &= 0 \end{aligned}$$



$$x = 3$$

~~$$x = -2$$~~

$$\begin{aligned} \log_2(x-2) + \log_2(x+1) &= 2 \\ \log_2(x^2 - x - 2) &= \log_2 4 \\ x^2 - x - 2 &= 4 \\ x^2 - x - 6 &= 0 \end{aligned}$$

See Left

Or Turn a number into a log!

$$2 = \log_2 m$$

$$2^2 = m$$

$$m = 4$$

$$2 = \log_2 4$$

$$\begin{aligned} \log_2(x-2) - 2 &= -\log_2(x+1) \\ \log_2(x-2) + \log_2(x+1) &= 2 \end{aligned}$$

Algebra

See Above

$$x-2 > 0$$

$$x > 2$$

~~$$x-1 > 0$$~~

~~$$x > -1$$~~

Reject

Redundant!

$$\log_3(x-11) - \log_3(x-3) = 2$$

$$\log_3 \frac{x-11}{x-3} = 2$$

$$\frac{x-11}{x-3} = 3^2$$

$$\frac{x-3}{x-11} = 9$$

$$x-3 = 9(x-11)$$

$$x-11 = 9x-27$$

$$16 = 8x$$

$$x = 2$$

$$x > 3$$

$$2 \log_5 x + \log_5 x = 3$$

$$\log_5 x^2 + \log_5 x = 3$$

$$\log_5 x^2 \times x = 3$$

$$\log_5 x^3 = 3$$

$$x^3 = 5^3$$

$$x = 5$$

$$x > 0$$

Must Bring exponents up 1st!

$$(\log x)^2 - \log x^3 = 4$$

$$(\log x)^2 - 3 \log x = 4$$

$$m^2 - 3m - 4 = 0$$

$$(m-4)(m+1) = 0$$

let  $m = \log x$

$$m = 4$$

$$\log x = 4$$

$$x = 10^4$$

$$m = -1$$

$$\log x = -1$$

$$x = 10^{-1}$$