

SOLVING
DAY 4 - LOG EQUATIONS

I. * one log on one side
→ put into exp. form.

SOLVE.

① $\log_x 9 = 2$

$$\sqrt{x^2} = \sqrt{9}$$

$$\boxed{x = 3}$$

② $\log_{27} x = \frac{1}{3}$

$$27^{1/3} = x = \sqrt[3]{27} = \boxed{3}$$

II. one log per side → drop the logs

③ $\log(-x-2) = \log(2x+7)$

$$-x-2 = 2x+7 \quad -9 = 3x$$

$$+x \quad -7$$

$$+x \quad -7$$

$$\boxed{x = -3}$$

④ $\log_4(2x-1) = \log_4(-x+2)$
 $x=1$

⑤ $\log_7(3x-10) = \log_7(2x+5)$
 $x=15$

⑥ ~~$\log_5(x^2+23) = \log_5(-10x+2)$~~

$$x^2 + 23 = -10x + 2$$

$$x^2 + 10x + 21 = 0$$

$$(x+3)(x+7) = 0$$

$$\begin{array}{r} 21 \\ 7 \times 3 \\ \hline 10 \end{array}$$

$$x+3=0$$

$$x+7=0$$

$$x=-3$$

$$x=-7$$

⑦ $\log(x^2-4x) = \log(-9+2x)$

CHANGE
OF
BASE
FORMULA

$$\log_a n = \frac{\log n}{\log a}$$

← understood
base 10
→ like calc!

$$\log_6 39 = \frac{\log 39}{\log 6} = 2.04$$

$$\log_7 11 = 1.23$$

$$\frac{\log(11)}{\log(7)}$$

$$\log_3 6 = 1.63$$

$$\frac{\log(6)}{\log(3)}$$

$$\log_5 30 = 2.11$$

$$\frac{\log(30)}{\log(5)}$$