

LOG REVIEW

$$\begin{aligned} 1) \quad 81^{3/2} &= \sqrt[2]{81^3} \\ &= 9^3 \\ &= 729 \end{aligned}$$

d-f)

$$\log_5 \frac{1}{125} = \log_5 5^{-3} = -3$$

$$e^{4 \ln 2} = e^{\ln 2^4} = 2^4 = 16$$

$$\begin{aligned} 1) &\equiv \left(4^{-3/2} + 3^{-3} \right)^{-1} \\ &= \left(\frac{1}{\sqrt[2]{4^3}} + \frac{1}{3^3} \right)^{-1} \\ &= \left(\frac{1}{8} + \frac{1}{27} \right)^{-1} \\ &= \left(\frac{27 + 8}{216} \right)^{-1} \\ &= \left(\frac{35}{216} \right)^{-1} \\ &= \frac{216}{35} \end{aligned}$$

Solving Equations

If problem starts with logs

- 1) Combine logs to get one per side.
- 2) Exponentiate

If problems starts with x in the exponent.

$$5 + 2^{3x-1} = 9$$

- 1) Isolate the exponentiated part.

- 2) Add logs to both sides & plug.

Like
3(c)

$$\log_{\frac{1}{9}} 27 = x$$

$$\frac{1}{9}^{\log_{\frac{1}{9}} 27} = \frac{1}{9}^x$$

$$27 = \frac{1}{9}^x$$

$$\log 27 = x \log \frac{1}{9}$$

$$\frac{\log 27}{\log \frac{1}{9}} = \frac{x \cdot \log \frac{1}{9}}{\log \frac{1}{9}}$$

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

$$\rightarrow 3^3 = 3^{-2x}$$

$$3 = -2x$$

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

d-9

$$\log_x x + \log_x^{5-x}(x-5) = 2$$

$$\log_6(x^2 - 5x) = 2$$

$$x^2 - 5x = 36$$

$$x^2 - 5x - 36 = 0$$

$$(x-9)(x+4) = 0$$

$$x = 9, -4$$

$$\left\{ \begin{array}{l} 1) 2\log_3 4^2 - \frac{1}{3}\log_6 8^{\frac{1}{3}} = \dots \end{array} \right.$$

$$b) \ln(2x) + \ln(x+4) = 7$$

$$e^{\ln(2x^2+8x)} = e^7$$

$$2x^2 + 8x = e^7$$

$$2x^2 + 8x - e^7 = 0$$

$$x = \frac{-8 \pm \sqrt{8^2 - 4(2)(-e^7)}}{2(2)}$$

Like m

$$e^{2x} - 3e^x = 28$$

$$e^{2x} - 3e^x - 28 = 0$$

$$(e^x - 7)(e^x + 4) = 0$$

UNFOK!

$$e^x - 7 = 0 \quad e^x + 4 = 0$$

$$\ln e^x = \ln 7 \quad \ln e^x = \ln(-4)$$

$$x = \ln 7 \quad x = \cancel{\ln(-4)}$$

$$7^{2x+5} = 5^{8-x}$$

$$\log 7^{2x+5} = \log 5^{8-x}$$

$$(2x+5)\log 7 = (8-x)\log 5$$

$$2x\log 7 + 5\log 7 = 8\log 5 - x\log 5$$

$$2x\log 7 + x\log 5 = 8\log 5 - 5\log 7$$

Pull out x!

$$x[2\log 7 + \log 5] = 8\log 5 - 5\log 7$$

$$x = \frac{8\log 5 - 5\log 7}{2\log 7 + \log 5}$$

Graph

$$y = -e^{x+3} - 1$$

Down 1
Left 3

0	-1	$\cdot e$
1	-2.7	
2	-7.4	



$$y = \ln(4-x) + 2$$

Up 2, Right 4

1	0
2.7	1
7.4	2