

WARMUP

Key

① write in exponential form $\ln 16 = R$

$e^R = 16$

② write in logarithmic form $e^{-3x} = 10$

$\ln 10 = -3x$

Solve for x

* ③ $\log_x \frac{1}{16} = -4$
 $x^{-4} = \frac{1}{16}$ $x = 2$

④ $\ln e^{\sqrt{7}} = x$
 $\sqrt{7} \ln e = x$ $x = \sqrt{7}$

⑤ $\log_{x^3} (64) = \frac{2}{3}$
 $(x^3)^{\frac{2}{3}} = 64$ $x^2 = 64$ $x = 8$ ~~$x = -8$~~

⑥ $\log_4 (\frac{1}{16}) = x$
 $4^x = \frac{1}{16}$ $4^x = 4^{-2}$
 $x = -2$

⑦ EXPAND $\log_3 \frac{2}{4x^5} = \log_3 2 - (\log_3 4 + 5 \log_3 x)$

⑧ CONDENSE $\frac{1}{3} \ln 64 + 3(\ln 8 - \ln 4)$
 $= \ln 64^{\frac{1}{3}} + 3(\ln \frac{8}{4}) = \ln 4 + \ln 2^3 = \ln (4 \cdot 8) = \ln 32$

⑨ EXPONENTIAL Growth or Decay?

Ⓐ $f(x) = \frac{2}{3} e^{x+1}$ **Growth**

Ⓑ $f(x) = e^{-2x}$ **Decay**

⑩ Solve for x

$\ln x^2 = \ln 8 + \ln 10 - \ln 5$
 $\ln x^2 = \ln \frac{80}{5}$ $\ln x^2 = \ln 16$ $x^2 = 16$ $x = \pm 4$

⑪ Graph and Give properties

$f(x) = 2 + \ln(x+3)$
 compare d to $f(x) = \ln x$
 up 2
 rt 3

x	y
-2	2
-3	3

