# WED 9-14-05

GOOD MORNING!

HELLO

CA

# LOGARITHMS ARE EXPONENTS.

$\log \equiv \log_{10}$

$\log 100 = \log_{10} 100 = 2$

G.C. $\log(100) = 2$

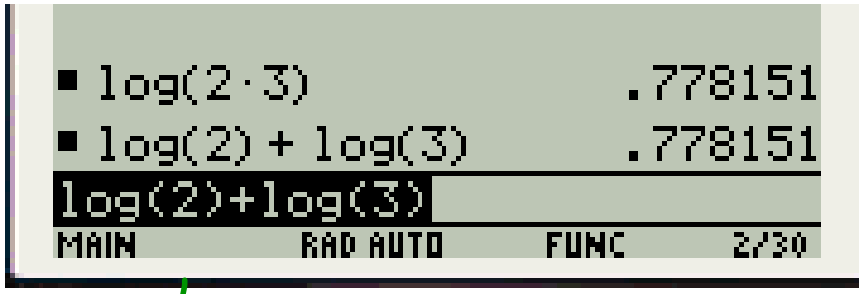
$\log 1 = 0$

$\log 0.1 = \log 10^{-1} = -1$

**DEFN:** $\log_b a = c \Rightarrow b^c = a$

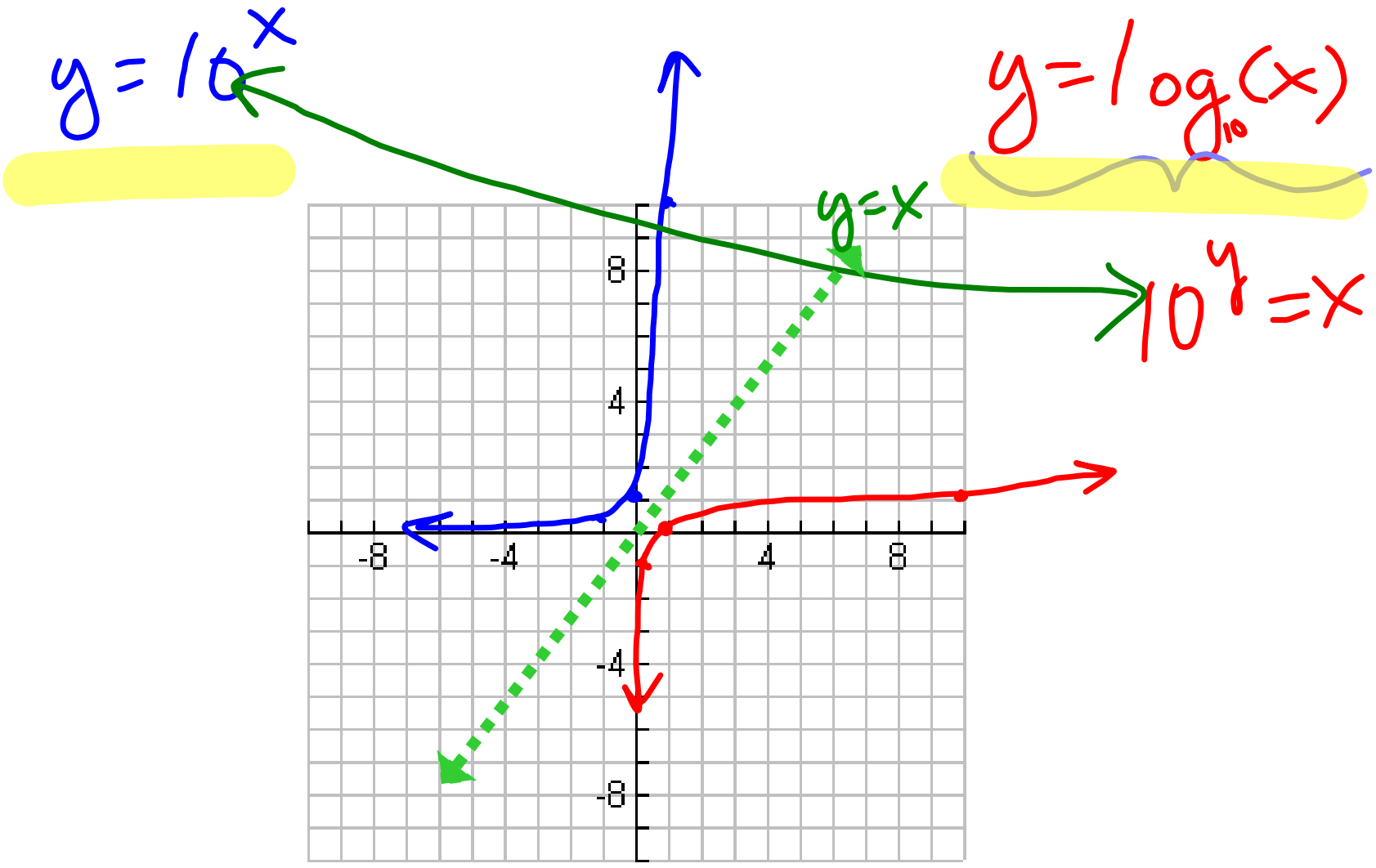
# LAWS OF LOGS

① $\log_b(a \cdot c) = \log_b a + \log_b c$




② $\log_b\left(\frac{a}{c}\right) = \log_b a - \log_b c$

③ $\log_b a^c = c \cdot \log_b a$


$y = 10^x$
$y = \log_{10}(x)$
$y = x$
$10^y = x$
8
4
-4
-8
-8
-4
4
8

Ex) Solve to 3 dec. places.

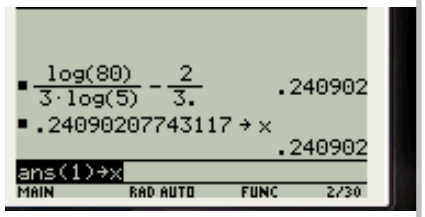
$$5^{3x+2} = 80$$

$$\log 5^{3x+2} = \log 80$$

$$\frac{(3x+2)\cdot \cancel{\log 5}^{1}}{\cancel{\log 5}} = \frac{\log 80}{\log 5} = 16$$

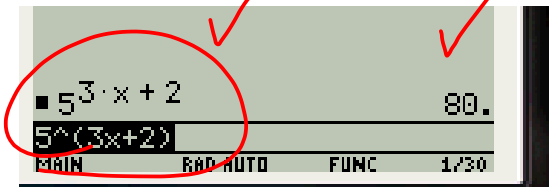
$$3x+2 = \frac{\log 80}{\log 5}$$

$$\frac{1}{3}\cdot 3x = \left[\frac{\log 80}{\log 5} - 2\right]\frac{1}{3}$$




$$x = \frac{\log 80}{3\log 5} - \frac{2}{3} \doteq .241$$

EXACT ANSWER



$$\ln(x) \equiv \log_e(x)$$

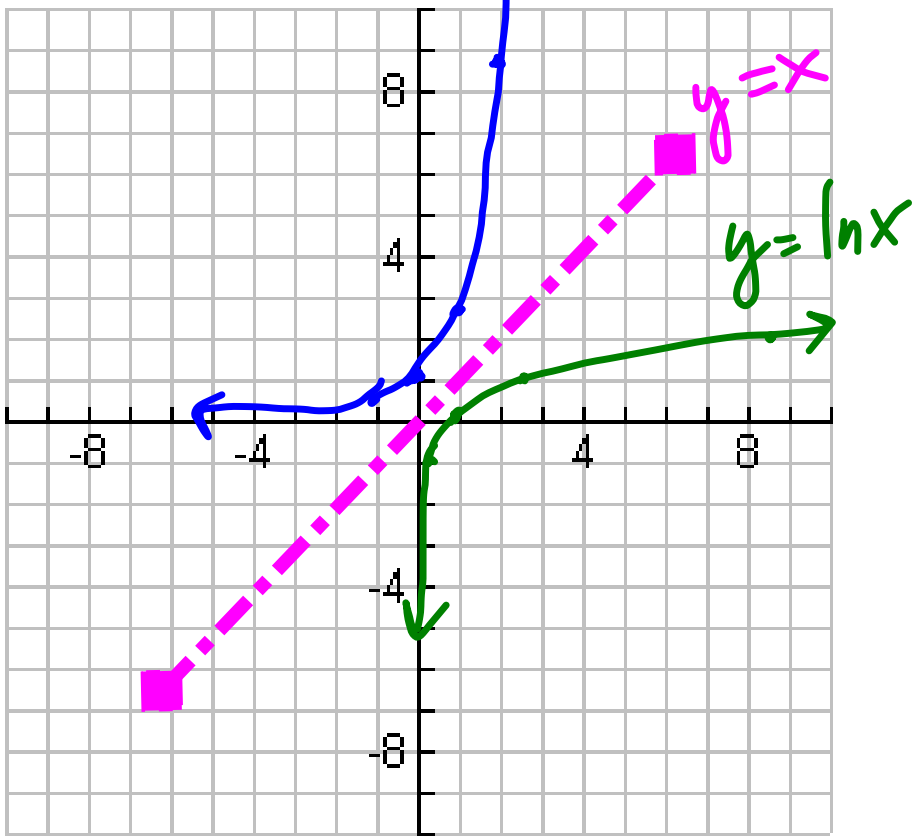
$y = \ln x$

$\ln 7 = \log_e 7$

$y = e^x$

$y = \ln x \rightarrow y = \log_e x$

$\rightarrow e^y = x$



Ex) Solve: $4 \cdot e^{2t-3} = 35$

$$e^{2t-3} = \frac{35}{4}$$

$$\ln e^{2t-3} = \ln\left(\frac{35}{4}\right)$$

$$(2t-3) \cdot \ln e = \ln\left(\frac{35}{4}\right)$$

$$2t-3 = \ln\left(\frac{35}{4}\right)$$

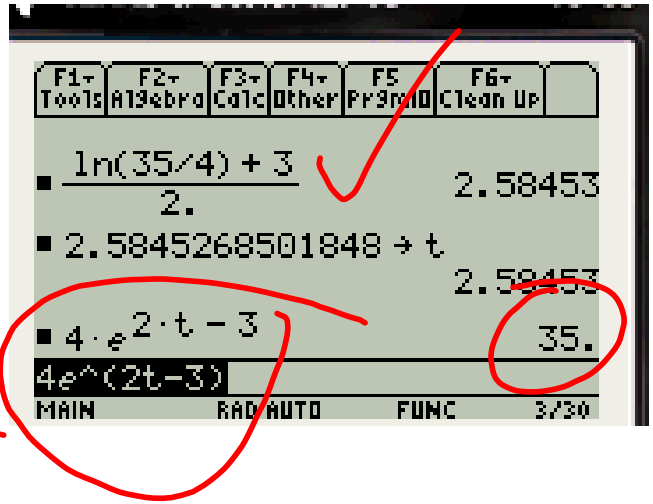
$$2t = \ln\left(\frac{35}{4}\right) + 3$$

$$t = \frac{\ln\left(\frac{35}{4}\right) + 3}{2} \approx 2.585$$

ASIDE

$\ln e = ?$

$\log_e e = 1$



# O.T.L.

- SHORT GIFT 1–10
- CORRECT TODAY'S O.T.L. & BRING?