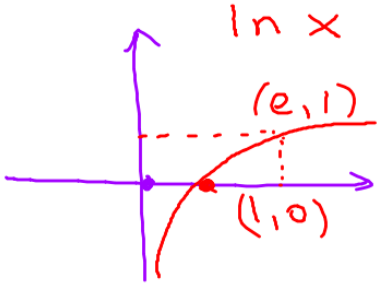
Bellwork Monday 12/18

Evaluate

$\ln 1 = 0$

$\ln e = 1$

$\ln 0 =$ undefined



V.A y-axis

$\ln$ (input) = output

the input of the log should always be positive

Section 3.5: Equation Solving and Modeling.

Solve the following equation:

Ex1: $\log x^2 = 2$

(P) $\frac{2\log x}{2} = \frac{2}{2}$

$\log_{10} x = 1$

$10^1 = x$

$x = 10$

this method does not lead to all solutions.

$\log_{10} x^2 = 2$

$10^2 = x^2$

$\pm\sqrt{100} = \sqrt{x^2}$

$\pm 10 = x$

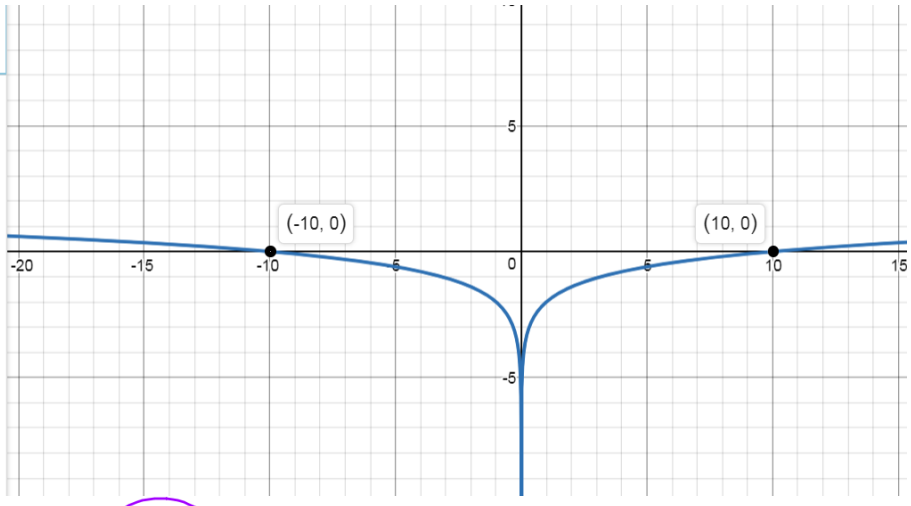
$x = 10$ ✓

$x = -10$ ✓

Domain?? $\log x^2$ $(-\infty, \infty)$ excluding 0

All real numbers excluding 0

$\log(x^2) - 2$



Ex2: $\log_2(x+1) = 3$

$2^3 = x+1$

$8 = x+1$

$\boxed{x=7}$

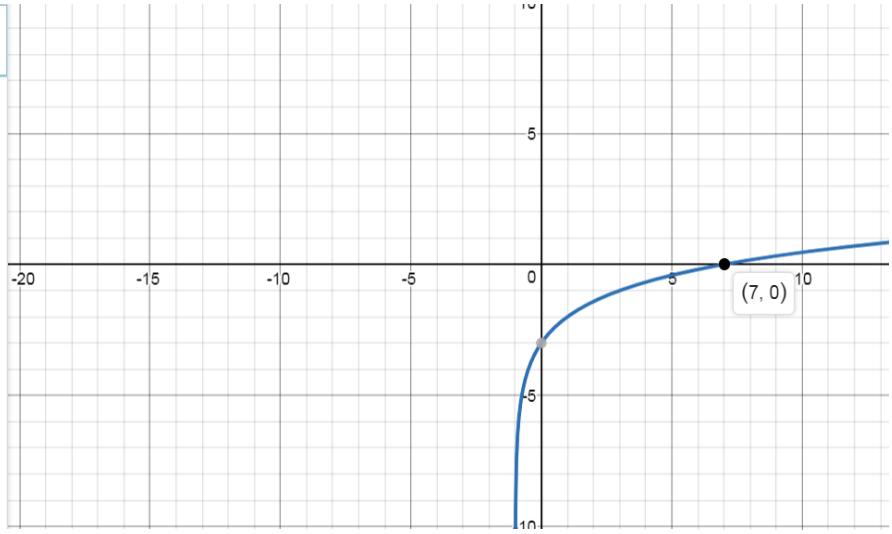
proved graphically

$\log_2(x+1) - 3 = 0$

y-int: plug in 0 for x

$\log_2(0+1) - 3 = \log_2 1 - 3$

$\log_2(x+1)-3$



Ex 3: $\ln(3x-2)+\ln(x-1)=2\ln x$ (R)

write it as a single log (M)

$\ln(3x-2)(x-1)=\ln x^2$

$(3x-2)(x-1)=x^2$

$3x^2-3x-2x+2=x^2$

$-x^2 \quad -x^2$

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

$a=2$, $b=-5$, $c=2$

$-1 \times -4 = 4$, $-1-4=-5$

$(x-\frac{1}{2})(x-\frac{4}{2})=0$

$x=\frac{1}{2}$ ~~$x=\frac{1}{2}$~~ $\quad x=2$

excluded value

the input of log should always be +

$\ln(3x-2)$

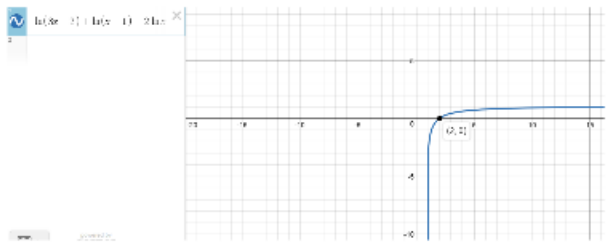
$\ln(3\cdot\frac{1}{2}-2)$ (−)

Solve by graphing:

$\ln(3x-2)+\ln(x-1)=2\ln x$

$-2\ln x \quad -2\ln x$

$\ln(3x-2)+\ln(x-1)-2\ln x=0$



Hw: p 301 : 1–10 , 25–28 , 35–38 .