

7.6 NATURAL LOGARITHMS

RECALL $e \approx 2.71828$

$$\text{NATURAL LOG} = \log_e x = \ln x$$

EX: WRITE AS A SINGLE LOGARITHM

$$\begin{aligned} & \ln a - 2 \ln b + \frac{1}{2} \ln c \\ &= \ln a - \ln b^2 + \ln \sqrt{c} \\ &= \ln \frac{a\sqrt{c}}{b^2} \end{aligned}$$

EX: SOLVE $3 - 4 \ln(8x+1) = 12$

$$-4 \ln(8x+1) = 9$$

$$\ln(8x+1) = -\frac{9}{4}$$

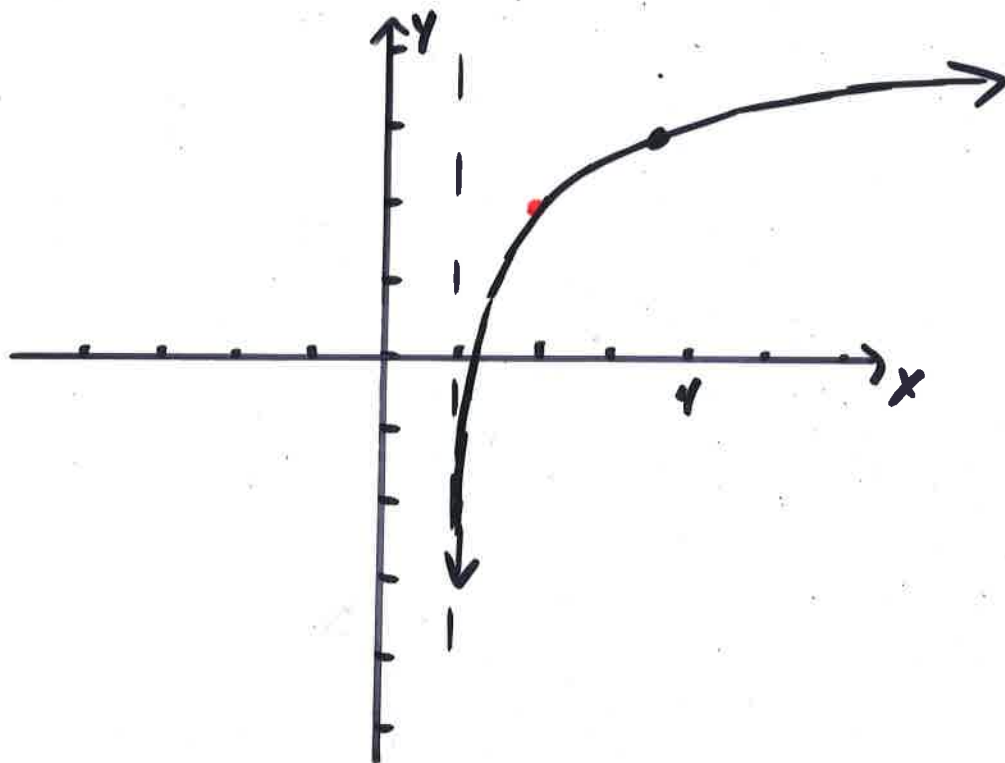
$$e^{-\frac{9}{4}} = 8x+1$$

$$8x = e^{-\frac{9}{4}} - 1$$

$$x = \frac{e^{-\frac{9}{4}} - 1}{8}$$

Ex: GRAPH $Y = \ln(x-1) + 2$

| X | Y |
|---------|---|
| 2 | 2 |
| $e+1$ | 3 |
| e^2+1 | 4 |



Ex: Solve $e^{x+1} = 30$

$$\ln e^{x+1} = \ln 30$$

$$x+1 = \ln 30$$

$$x = \ln 30 - 1 \approx$$