15) $0.5 = 1(1-0.05)^t$

P = amount of Hair

P_0 = amount of Hair to start with

$$P = P_0(1-0.05)^t$$

$$\frac{1}{2}P_0 = P_0(1-0.05)^t$$

$$\ln 0.5 = t \ln(0.95)$$

$$\frac{\ln(0.5)}{\ln(.95)} = t \approx 13.5 \text{ or } 54$$

53.5

$\ln(x) - \ln(y) = \ln\left(\frac{x}{y}\right)$

a) $A = A_0 e^{rt}$ $\quad A = Pe^{kt}$

$\downarrow$

$1000\, e^{kt}$

It doubles every 40 minutes, $k(40)$

$$\frac{2000}{1000} = \frac{1000}{1000} e$$

$$2 = e^{k(40)}$$

$$\ln 2 = \ln e^{40k}$$

$$\frac{\ln 2}{40} = \frac{40k}{40}$$

$$0.0173 = k$$

$$A(t) = 1000\, e^{0.0173t}$$

NON CALCULATOR

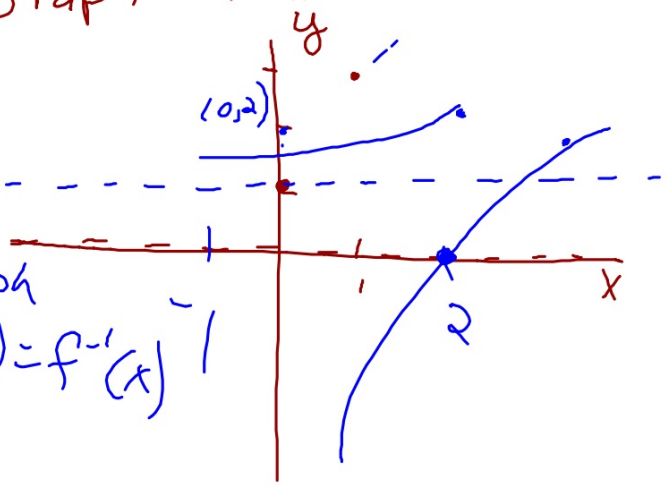
Graph w/ transformations (Do worksheet)

use log rules to simplify an expression – might even be a number

graph

Sketch the graph of an exponential, then its inverse logarithm within the given domain

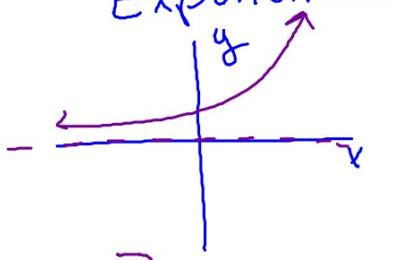
Ex) a) Graph $f(x) = e^{x-2}$: $-1 \le x \le 2$



b) graph $g(x) = f^{-1}(x)$

Summary

Exponential



D: $\mathbb{R}$

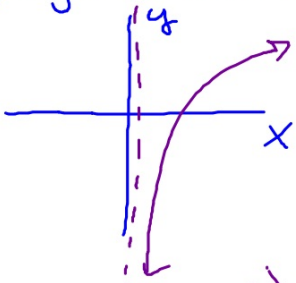
R: $(0, \infty)$

asymptote: $y = 0$

$f(x) = a^x$

$(0,1)$ and $(1,a)$

Logarithmic



D: $(0, \infty)$

R: $\mathbb{R}$

asymptote at $x = 0$

$f(x) = \log_a x$

$(1,0), (a,1)$

$$y = a^x \iff \log_a y = x$$