

12) a) $\ln(x+1) = 2$

$$e^2 = x+1$$

b) $\ln(x-1) = 4$

$$e^4 = x-1$$

24) a) $\log_5 125 = \log_5 5^3 = 3$

b) $\log_{49} 7 = \log_{49} 49^{1/2} = \frac{1}{2}$

c) $\log_9 \sqrt{3} = \log_9 3^{1/2} = \log_9 (9^{1/2})^{1/2} = \log_9 9^{1/4} = \frac{1}{4}$

26) $e^{\ln \pi} = \pi$

b) $10^{\log 5} = 5$

c) $10^{\log 87} = 87$

28) a) $\log_4 \sqrt{2} =$

$$= \log_4 2^{1/2} = \log_4 (4^{1/2})^{1/2} = \log_4 4^{1/4} = \frac{1}{4}$$

b) $\log_4 \frac{1}{2} =$

$$= \log_4 2^{-1} = \log_4 (4^{1/2})^{-1} = \log_4 4^{-1/2} = -\frac{1}{2}$$

c) $\log_4 8 = \log_4 2^3 = \log_4 (4^{1/2})^3 = \log_4 4^{3/2} = \frac{3}{2}$

32) a) $\log_4 2 = x$

b) $\log_4 x = 2$ $x = \log_4 2 = \log_4 4^{1/2} = \frac{1}{2} = x$

$$\log_4 x = 2 \Rightarrow x = 4^2 = 16 = x$$

34) a) $\log_x 1000 = 3$

$$\Rightarrow x^3 = 1000 \Rightarrow x = 10$$

b) $\log_x 25 = 2$

$$\Rightarrow x^2 = 25 \Rightarrow x = 5$$

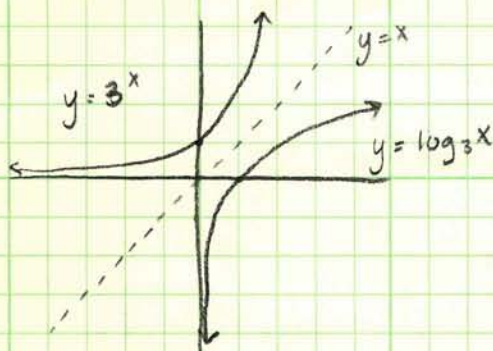
40) a) $\ln 27 \approx 3.2958$

b) $\ln 7.39 \approx 2.0001$

c) $\ln 54.6 \approx 4.0000$

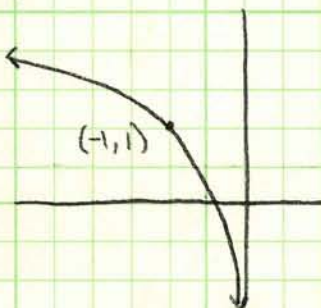
52, 60, 94

52) $y = 3^x$; $y = \log_3 x$



60) $y = 1 + \ln(-x)$; $f(x) = \ln(x)$

reflect $f(x)$ about y -axis
and shift upward one unit



Domain: $(-\infty, 0)$

Range: $(-\infty, \infty)$

vertical asymptote: $x = 0$

94) which is larger $\log_4 17$ or $\log_5 24$? Explain

we have $\log_4 17 > \log_4 16 = \log_4 4^2 = 2$

and $\log_5 24 < \log_5 25 = \log_5 5^2 = 2$

so, $\log_5 24 < 2 < \log_4 17$