

Sec 3.2 Graphing Log & Natural Logs pg 236 # 3-60 (x3)

$\log_b y = x \iff b^x = y$

#3) $\log_7 \frac{1}{49} = -2$
 $7^{-2} = \frac{1}{49}$

#6) $\log_{16} 8 = \frac{3}{4}$
 $16^{\frac{3}{4}} = 8$

#9) $5^3 = 125$
 $\log_5 125 = 3$

#12) $9^{\frac{3}{2}} = 27$
 $\log_9 27 = \frac{3}{2}$

#15) $e^3 = 20.0855\dots$
 $\ln e 20.0855 = 3$

#18) $e^\pi = 23.140\dots$
 $\ln e 23.140\dots = \pi$

Note! when using base e we need to use \ln to change to logarithmic form

* #21) $\log_{16} (\frac{1}{4})$
 $\log_{16} 1 - \log_{16} 4$
 $0 - \frac{1}{2}$
 $-\frac{1}{2}$

$4^{\frac{1}{2}} = 2$
 $\frac{1}{2} = x$

#24) $\log_{10} 0.1$
 $\log_{10} (\frac{1}{10})$
 $\log_{10} (10)^{-1}$
 -1

#27) $\ln e^8 = X$
 $8 \ln e = X$
 $8 = X$
 Note: $\ln e = 1$

#30) $\log_2 2^{-1} = X$
 $-1 \log_2 2 = X$
 $-1 = X$

#33) $\log_{10} (\frac{4}{5})$
 ≈ -0.097

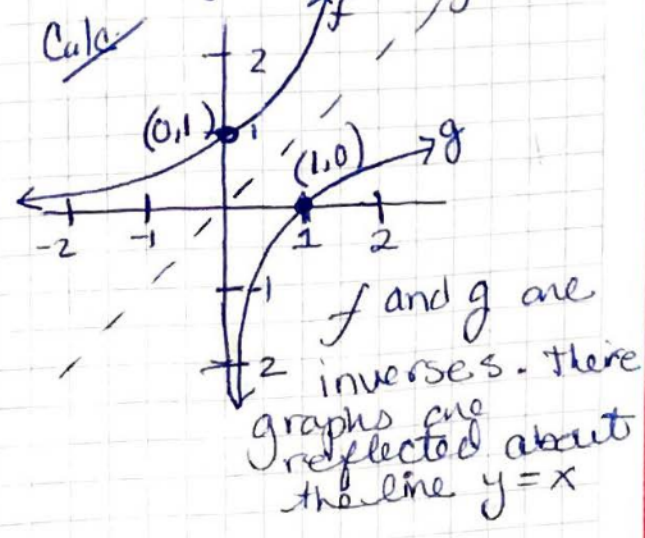
#36) $\ln(\sqrt{5}-2)$
 ≈ -1.444

Note: $\log_a a = 1$

#42) $-5.5 \ln 34$
 ≈ -19.395

#45) $f(x) = e^x$
 $g(x) = \ln x$
 $y = x$

#39) $6 \log_{10} 14.8$
 ≈ 7.022



#48) $f(x) = -\log_3 x$
 It's graph (f) b/c Asy: $x=0$ and is reflected over x -axis

#51) $f(x) = \log(1-x)$
 It's graph (b) b/c Asy: $x=1$ and pt: $(0,0)$

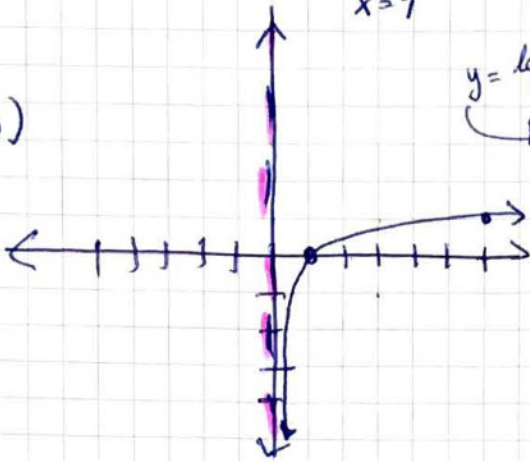
#54) $g(x) = \log_6 x$

D: $\{x \in \mathbb{R} \mid x > 0\}$

V-Asy: $x = 0$

Intercept: $(1, 0)$

x	y
1	0
6	1



$-\log_3(x+2) = 0$
 $-\log_3 x = -2$
 $\log_3 x = 2$
 $x = 3^2$
 $x = 9$

#57) $y = -\log_3 x + 2$

D: $\{x \in \mathbb{R} \mid x > 0\}$

V-Asy: $x = 0$

Intercept: $(9, 0)$

x	y
1	0
3	1

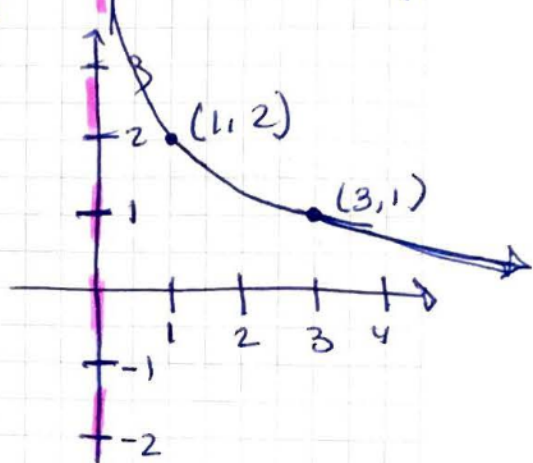
$y = \log_3 x$

x	y
1	0
3	-1

$y = -\log_3 x$

x	y
1	2
3	1

$y = -\log_3 x + 2$



refl. over x-axis

2 units up

#60) $f(x) = -\log_3(x+2) - 4$

D: $\{x \in \mathbb{R} \mid x > -2\}$

V-Asy: $x = -2$

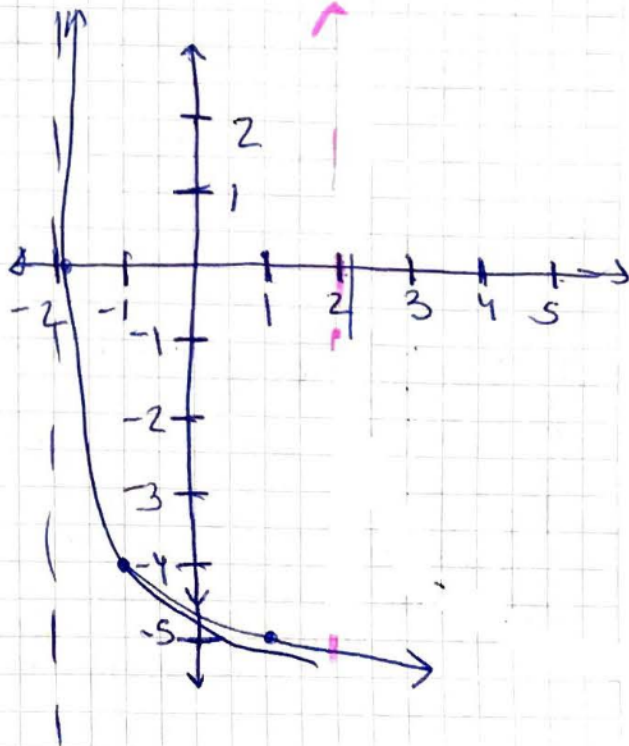
Intercept: $(20, 0)$

x	y
1	0
3	1

$n=2$ $r=-4$

x	y
-1	-4
1	-5

big reflect



$-\log_3(x+2) - 4 = 0$

$-\log_3(x+2) = 4$

$\log_3(x+2) = -4$

$x+2 = 3^{-4}$

$x+2 = \frac{1}{81}$

$x+2 = \frac{1}{81}$

$x = \frac{1}{81} - 2 \rightarrow x = \frac{-161}{81} \approx -1.99$

$$-\frac{62}{81}$$