

3.2a p.199-201 (1, 3, 7-43 odd, 51-54 all, 109)

① logarithmic function

③. $\log_a a^x = x$

\Downarrow
 $a^x = a^x$

and $a^{\log_a x} = x$

$\log_a x = \log_a x$

②9. $h(x) = 6 \log_{10} x$
if $x = 148$

$= 6 \log_{10} (14.8)$
 ≈ 7.022

⑦. $\log_4 64 = 3$

$4^3 = 64$

②1. $g^a = 4$

$\log_g 4 = a$

⑨. $\log_7 \frac{1}{49} = -2$

$7^{-2} = \frac{1}{49}$

②3. $f(x) = \log_2 x$ if $x = 16$

$f(16) = \log_2 16$

$2^{\square} = 16$

$\square = 4$

③1. $\log_7 x = \log_7 9$

$x = 9$

①1. $\log_{32} 4 = \frac{2}{5}$

$32^{\frac{2}{5}} = 4$

②5. $g(x) = \log_{10} x$ if $x = \frac{1}{1000}$

$g\left(\frac{1}{1000}\right) = \log_{10} \frac{1}{1000}$

$10^{\square} = \frac{1}{1000}$

$10^{\square} = 10^{-3}$

$\square = -3$

③3. $\log_4 4^2 = x$

$4^x = 4^2$

$x = 2$

①3. $\log_2 \sqrt{2} = \frac{1}{2}$

$2^{\frac{1}{2}} = \sqrt{2}$

③5. $\log_8 X = \log_8 10^{-1}$

$X = 10^{-1}$

$x = \frac{1}{10}$

①5. $5^3 = 125$

$\log_5 125 = 3$

②7. $f(x) = \log_{10} x$ $x = 345$

$f(345) = \log_{10} 345$

use calc.

≈ 2.538

③7. $\log_4 4^{3x} = \square$

$4^{\square} = 4^{3x}$

$\square = 3x$

①7. $8^{\frac{1}{4}} = 3$

$\log_{81} 3 = \frac{1}{4}$

①9. $6^{-2} = \frac{1}{36}$

$\log_6 \frac{1}{36} = -2$

39. $3 \log_2 \frac{1}{2} = \square$

$(\log_2 \frac{1}{2})^3 = \square$

$2^\square = (\frac{1}{2})^3$

$2^\square = (2^{-1})^3$

$2^\square = 2^{-3}$

-3

45. ~~$y = \log_{10}(x+2)$~~

51. $f(x) = \log_3 x + 2$

(b)

vert shift up 2



52. $f(x) = -\log_3 x$

reflect over x-axis

(c)

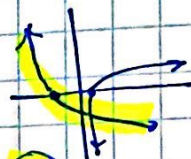


53. $f(x) = -\log_3(x+2)$

reflect over x-axis

horiz shift 2 left

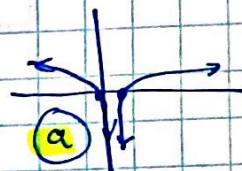
(d)



54. $f(x) = \log_3(1-x)$

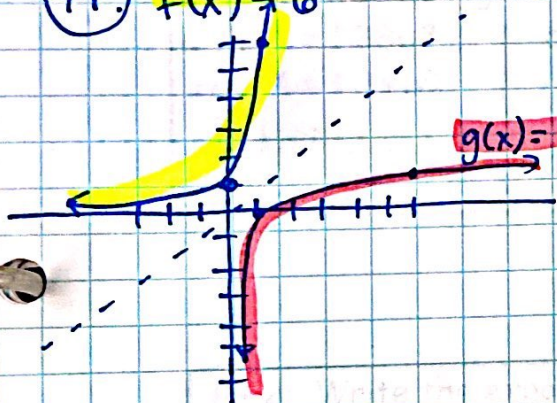
$= \log_3(-x+1)$

shift 1 unit to left, then reflect over y-axis



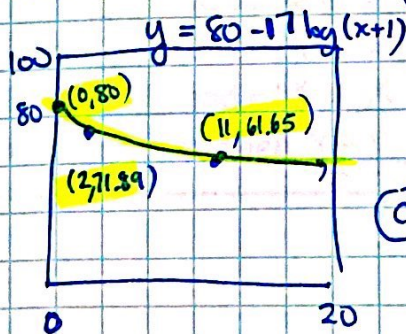
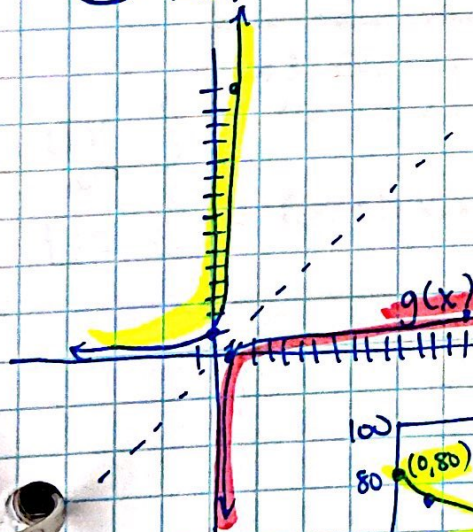
41. $f(x) = 6^x$

$g(x) = \log_6 x$



43. $f(x) = 15^x$

$g(x) = \log_{15} x$



109. $f(t) = 80 - 17 \log_{10}(t+1)$

$0 \leq t \leq 12$

(a) $f(0) = 80 - 17(\log_{10}(0+1))$
 $= 80 - 17(0)$
 $= \mathbf{80}$

(b) $f(2) = 80 - 17(\log_{10}(2+1))$
 $= 80 - 17(\log_{10} 3)$
 $= 80 - 17(0.47712)$
 $\approx \mathbf{71.89}$

(c) $f(11) = 80 - 17(\log_{10}(11+1))$
 $= 80 - 17(\log_{10} 12)$
 $\approx \mathbf{61.65}$