Pg. 314-316

#19-22, 27-38, 43-50, 63-65, 73-75, 77, 79ab

19) $f(x) = 24(1 + 0.053)^x$

$f(x) = 24(1.053)^x$

$x$ = # of days

% change 5.3% incr.

Growth factor 1.053

20) $P(t) = 67000(1 + 0.0167)^t$

$P(t) = 67000(1.0167)^t$

$t$ = # of years

% change 1.67% incr

growth factor 1.0167

21) $f(x) = 18(2)^{x/3}$

$x$ = # of wks

or

$f(x) = 18(2)^{x/21}$

$x$ = # of days

22) $f(x) = 117\left(\frac{1}{2}\right)^{x/262}$

$x$ = # of hours

27-38 non. calc.

27) $\log_2 32 = \boxed{5}$

28) $\log_3 81 = \boxed{4}$

29) $\log \sqrt[3]{10} = \boxed{\frac{1}{3}}$

30) $\ln \frac{1}{\sqrt{e^7}} = \boxed{-\frac{7}{2}}$

$e^{-7/2}$

31) $\log_3 x = 5$

$\boxed{3^5 = x}$

32) $\log_2 x = y$

$\boxed{2^y = x}$

33) $\ln \frac{x}{y} = -2$

$e^{-2} = \frac{x}{y}$

or

$y = xe^2$

$\frac{x}{e^{-2}}$

34) $\log \frac{a}{b} = -3$

$10^{-3} = \frac{a}{b}$

or

$b = 1000a$

35) $f(x) = \log_2(x+4)$

shift $y = \log_2 x$ left 4

No calc!

V.A. $x = -4$

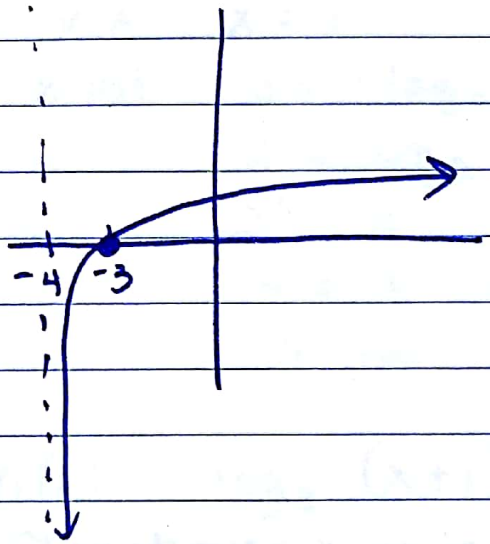
Domain $(-4, \infty)$

x-int $0 = \log_2(x+4)$

$2^0 = x+4$

$1 = x+4$

$-3 = x$ $(-3, 0)$




36) $g(x) = \log_2(4-x) = \log_2(-x+4) = \log_2(-1(x-4))$

· reflect across y-axis and shift right 4

· VA $x = 4$

· Domain $(-\infty, 4)$

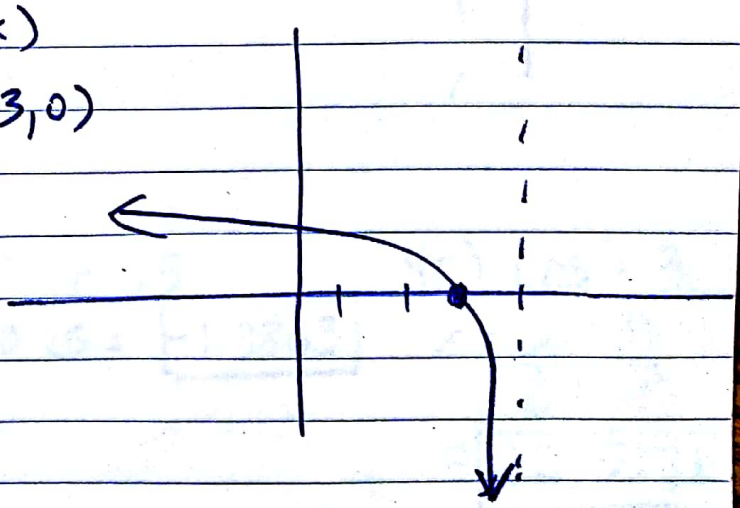
No calc!

· x-int $0 = \log_2(4-x)$ $(3, 0)$

$1 = 4-x$

$-3 = -x$

$3 = x$



37) $h(x) = -\log_2(x-1)+2$

- reflect over x-axis
- shift right 1 and up 2

Domain $(1, \infty)$

V.A. $x = 1$

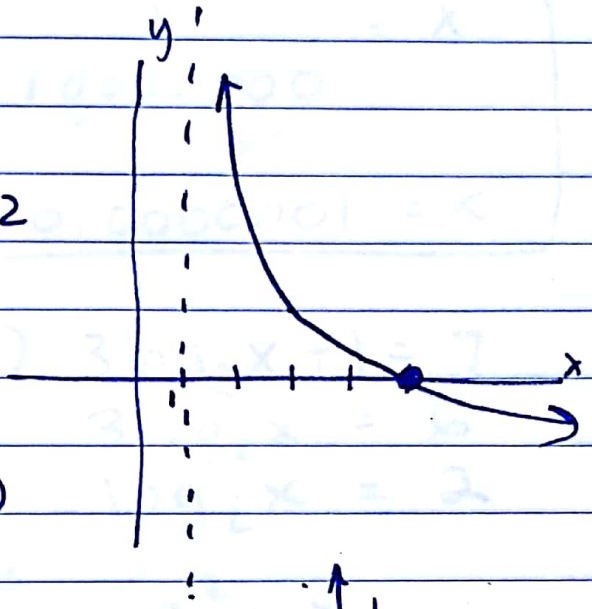
x-int $0 = -\log_2(x-1)+2$

$2 = \log_2(x-1)$

$2^2 = x-1$

$4 = x-1$

$5 = x$ $(5,0)$




38) $h(x) = -\log_2(x+1)+4$

- ~~reflect~~ over x axis
- shift left 1 up 4

Domain $(-1, \infty)$

VA $x = -1$

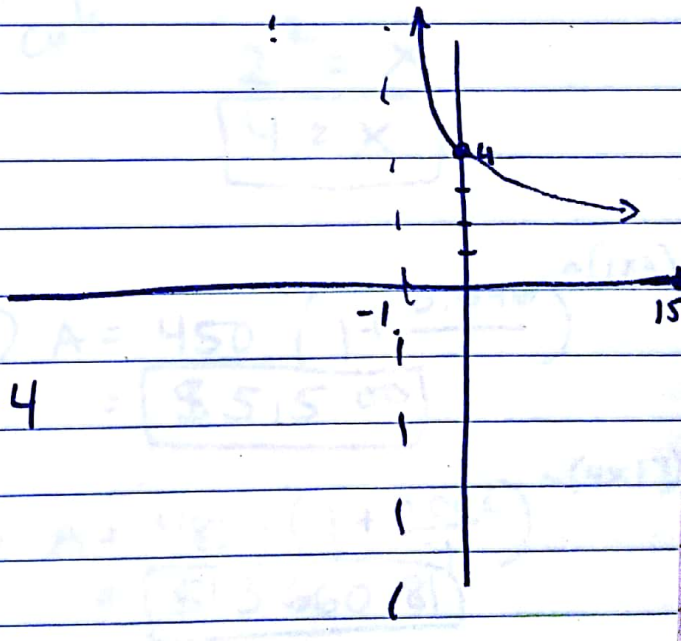
x-int $0 = -\log_2(x+1)+4$

$4 = \log_2(x+1)$

$2^4 = x+1$

$16 = x+1$ $(15,0)$

$15 = x$




43) $10^x = 4$

$\log 4 =$ **0.6021**

44) $e^x = 0.25$

$\ln 0.25 =$ **-1.3863**

45) $1.05^x = 3$

$x = \frac{\ln(3)}{\ln(1.05)}$

$\approx$ **22.5171**

46) $\ln x = 5.4$

$e^{5.4} \approx \boxed{221.4064}$

47) $\log x = -7$ (no calc)

$10^{-7} = x$

$\frac{1}{10{,}000{,}000} = x$

or

$0.0000001 = x$

48) $3^{x-3} = 5$

$x - 3 = \frac{\ln(5)}{\ln(3)}$

$x = \frac{\ln(5)}{\ln(3)} + 3$

$= \boxed{4.4650}$

49) $3\log_2 x + 1 = 7$

$3\log_2 x = 6$

$\log_2 x = 2$ (no calc)

$2^2 = x$

$\boxed{4 = x}$

50) $2\log_3 x - 3 = 4$

$2\log_3 x = 7$

$\log_3 x = \frac{7}{2}$

$3^{7/2} = x$

$\boxed{x = 46.7654}$

63) $A = 450\left(1 + \frac{0.046}{1}\right)^{\wedge(1\times3)}$

$= \boxed{\$515.00}$

64) $A = 4800\left(1 + \frac{0.062}{4}\right)^{\wedge(4\times17)}$

$= \boxed{\$13660.81}$

65) $A = Pe^{rt}$

73) a) $f(0) = 90$

b) $f(2) = 32.8722$

c) Graph in calc

74) a) $P(t) = 123000\,(1 - 0.024)^t$

$P(t) = 123000\,(0.976)^t$

b) 2 ways graph or use logs

12.86 years

75) a) $P(t) = 89000\,(1 - 0.018)^t$

$P(t) = 89000\,(0.982)^t$

b) 2 ways graph or use logs

31.74 years

77) a) $f(t) = 20(2)^t$ t = # of months

[redacted]

b) 1 yr = 12 mo $f(12) = 20(2)^{12} = 81920$

5 yr = 60 mo $f(60) = 20(2)^{60} = 2.3058 \times 10^{19}$

79) a) $S(t) = S_0 \cdot \left(\frac{1}{2}\right)^{t/1.5}$ t = # of sec

b) $S_0/2$ after 1.5 sec since $S_0\left(\frac{1}{2}\right)^{1.5/1.5}$

$S_0/4$ after 3 sec since $S_0\left(\frac{1}{2}\right)^{3/1.5}$

$S_0\left(\frac{1}{4}\right)$