

5.2 pg 398 1-6, 7-31 EOD, 33-43 odd, 51-71 EOD
75-79 odd, 85-91 odd, 93

① logarithmic ② 10 ③ natural, e ④ $a^{\log_a x} = x$

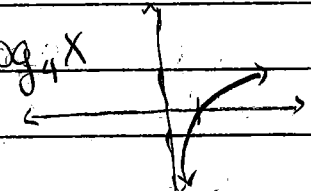
⑤ $x=y$ ⑥ positive real numbers

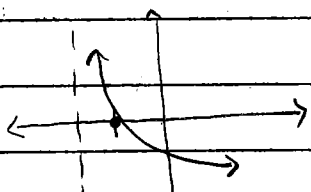
⑦ $\log_4 16 = 2$ $4^2 = 16$ ⑧ $\log_{32} 4 = \frac{2}{5}$ $\sqrt[5]{32} = 2$

⑨ $5^3 = 125$ $\log_5 125 = 3$ ⑩ $6^{-2} = \frac{1}{36}$ $\log_6 \frac{1}{36} = -2$

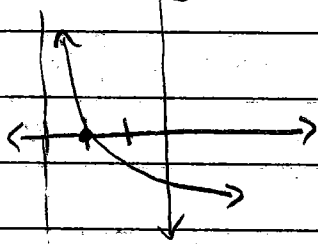
⑪ $\log_2 64$ $2^y = 64$ $y = 6$ ⑫ $\log_a a^2$ $2^y = a^2$ $y = 2$

⑬ $\log 12.5 = 1.097$ ⑭ 7 ⑮ 1

⑯ $\log_4 x$  $D: x > 0$
 $x\text{-int } e (1,0)$
vertical asymptote: $x=0$

⑰ $-\log_6(x+2)$ (-) reflection in x-axis
(+2) left 2
 Domain: $x > -2$ vert. asymptote $x = -2$
 $x\text{-int } e (-1,0)$

④ $f(x) = -\log_6(x+2)$

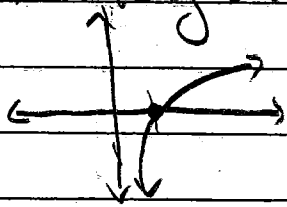


D: $x > -2$

VA: $x = -2$

x-int: $(-2, 0)$

⑤ $f(x) = \log\left(\frac{x}{7}\right)$



hs of 7

D: $x > 0$

VA: $x = 0$

x-int: $(7, 0)$

⑥ $\ln \frac{1}{2} = -.693$

$e^{-.693} = \frac{1}{2}$

⑦ $\ln 250 = 5.521$

$e^{5.521} = 250$

⑧ $e^4 = 54.5984$

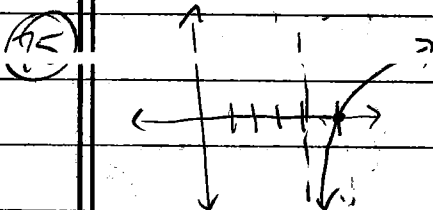
$\ln 54.598 = 4$

⑨ $e^{-0.9} = .406$

$\ln .406 = -.9$

⑩ $\ln 18.42 = 2.913$

⑪ $\ln e^5 = 5$

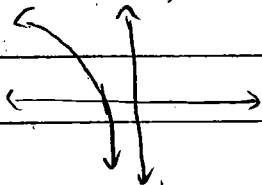


D: $x > 0$

VA: $x = 0$

x-int: $(4, 0)$

5.2 cont'd

(77) $f(x) = \ln(-x)$ Reflection in y-axis

D: $x < 0$
VA: $x = 0$
x-int: $(-1, 0)$

(79) Grapher

(85) $\log_5(x+1) = \log_5 6$
 $x+1 = 6$
 $x = 5$

(89) $\ln(x+4) = \ln 12$
 $x+4 = 12$
 $x = 8$

(97) $\log(2x+1) = \log 15$
 $2x+1 = 15$
 $2x = 14$
 $x = 7$

(91) $\ln(x^2-2) = \ln 23$
 $x^2-2 = 23$
 $x^2 = 25$
 $x = \pm 5$

(93) $t = 16.625 \ln\left(\frac{x}{x-750}\right)$ $x > 750$ $t = \text{years}$
 $x = \text{payment}$

(A) $t = 16.625 \ln\left(\frac{897.72}{897.72-750}\right)$
 $= 30 \text{ years}$

$t = 16.625 \ln\left(\frac{1659.24}{1659.24-750}\right)$
 $= 10 \text{ years}$

(B) $897.72(12)(30) = 323,179.20$ $1659.24(12)(10) = 199,108.80$

(C) $\frac{323,179.20}{150,000} = 2.154528$ $\frac{199,108.80}{150,000} = 1.327$

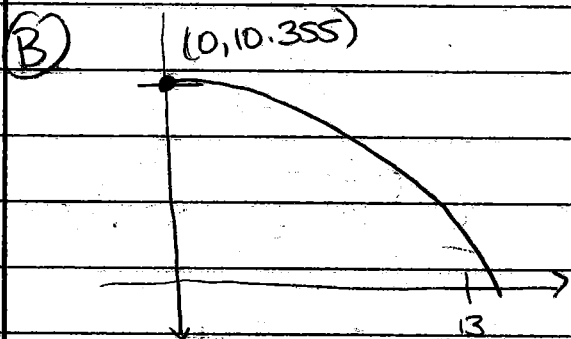
115.4537%

32.739%

(D) vertical asymptote @ $x = 750$
 minimum monthly payment must
 be greater than \$750

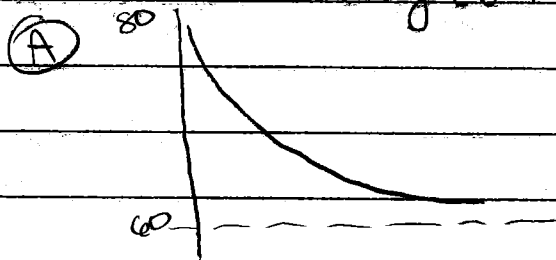
(95) $C = 10.355 - 0.298t + \text{Int} \quad 1 \leq t \leq 6$
 $t = \text{years} \quad t = 1 \quad 2001$

(A) t	1	2	3	4	5	6
C	10.355	9.942	9.373	8.703	7.957	7.151



(C) Values rapidly
 decrease after 6
 creating negative
 values eventually

(97) $f(t) = 80 - 17 \log(t+1) \quad 0 \leq t \leq 12 \quad t = \text{months}$



- (B) $f(0) = 80$
- (C) $f(4) = 68.118$
- (D) $f(10) = 62.296$

(98) $B = 10 \log \left(\frac{I}{10^{-12}} \right)$ (A) $10 \log \left(\frac{1}{10^{-12}} \right) = 10 \log (10^{12})$
 $= 10(12)$

(B) $10 \log \left(\frac{10^{-2}}{10^{-12}} \right) = 10 \log 10^{10}$
 $= 10(10)$
 $= 100$

(C) no, the difference
 is in relation to the logarithms
 of intensity and decibels

5.2 cont'd

105

$$f(x) = 10^x$$

x	-2	-1	0	1	2
f(x)	$\frac{1}{100}$	$\frac{1}{10}$	1	10	100

$$f(x) = \log x$$

x	$\frac{1}{100}$	$\frac{1}{10}$	1	10	100
f(x)	-2	-1	0	1	2

inverses

108

x	y
1	0
2	1
8	3

a) False

b) True

c) True

d) false

f(x) =

()

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5.2 pg. 398 1-5 7-27 odd 33-43 odd, 51-65 odd
75, 77, 85-93 odd, 97

1. logarithmic

2. 10

3. natural, e

4. $a^{\log_a x} = x$

5. $x = y$

7. $4^2 = 16$

(9) $9^{-2} = \frac{1}{81}$

(11) $32^{\frac{2}{5}} = 4$

13. $64^{\frac{1}{2}} = 8$

(15) $\log_5 125 = 3$

(17) $\log_{81} 3 = \frac{1}{4}$

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

(21) $\log_{24} 1 = 0$

23. $\log_2 64 = x$

$2^x = 64$

$2^x = 2^5$

$x = 5$

5

(25) $\log_8 1 = x$

$8^x = 1$

$8^x = 8^0$

$x = 0$

0

27. $\log_a a^2 = x$
 $a^x = a^2$

$x = 2$

2

(33) **7**

(35) **1**

37.

