OLYMPIC STEEL
625 Xenium Lane North • Minneapolis, MN 55441
1-612-544-7100 1-800-328-0757 1-612-544-0975/FAX

# Advanced Math

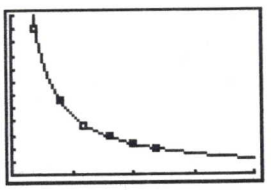
pg 347

20+21)

| L1 | L2 | L3 3 |
|---|---|---|
| .02 | 55.478 | |
| .04 | 28.011 | |
| .06 | 18.854 | |
| .08 | 14.275 | |
| .1 | 11.527 | |
| .12 | 9.694 | |
| ------- | ------- | |
| L3(1)= | | |

```
WINDOW
 Xmin=0
 Xmax=.2
 Xscl=.05
 Ymin=0
 Ymax=60
 Yscl=5
 Xres=1
```

```
PwrReg
 y=a*x^b
 a=1.222362848
 b=-.9740956532
```



45) $300 = 100e^{5k}$

$3 = e^{5k}$

$\ln 3 = 5k$

$.2197224577 = k$

$200 = 100e^{.2197224577t}$

$2 = e^{.2197224577t}$

$\ln 2 = .2197224577t$

3.15 hrs $= t$

46) $k = .0113328685$

$t = 61.163$ hrs

47) $\frac{1}{2}a = ae^{1620b}$

$-4.278686363 \times 10^{-4} = b$

$y = ae^{(-4.278686363\times10^{-4})(100)}$

$y = .95812a$

95.812 %

48) $\frac{1}{2}a = ae^{5730b}$

$-1.209680944 \times 10^{-4} = b$

$.15a = ae^{(-1.209\ldots\times10^{-4})(t)}$

$.15 = e^{(-1.209\ldots\times10^{-4})t}$

$\ln(.15) = -1.209680944\times10^{-4}t$

15682.813 yrs $= t$

50) $b = -.0213722607$

$t =$ $2422.72

52) $300000 = \frac{500000}{1+.6e^{2k}}$

$300000(1+.6e^{2k}) = 500000$

$300000 + 180000e^{2k} = 500000$

$180000e^{2k} = 200000$

$e^{2k} = 1.1$

$2k = \ln(1.1)$

$k = .0526802578$

280771 units

54) if $t=0$ is 1994

then $a = 742000$

$632000 = 742000e^{2k}$

$-.0802299245 = k$

#583275.41

56) $y=0$, $y=1000$

(notice top?)

1000 is the population limit

b) 203

c) 13.268 months

58) $R = \log_{10}\frac{I}{I_0}$

a) $8.6 = \log_{10}\frac{I}{1}$

$10^{8.6} = I$

398107170.6

b) $10^{6.7} = I = 5011872.336$

60) $B(I) = 10\log_{10}\frac{I}{I_0}$

a) $B(I) = 10\log_{10}\frac{10^{-13}}{10^{-16}}$

$= 10\log_{10}10^3$

$= 10(3) =$ 30dB

b) 85dB

c) 90 dB

d) 115dB

62) $88 = 10\log_{10}\frac{I}{10^{-16}}$

$8.8 = \log_{10}\frac{I}{10^{-16}}$

$10^{8.8} = \frac{I}{10^{-16}}$

$10^{8.8}\cdot10^{-16} = I = 10^{-7.2}$

$72dB \rightarrow I = 10^{-8.8}$

$\frac{10^{-7.2} - 10^{-8.8}}{10^{-7.2}} = 97.488\%$

64) $pH = -\log_{10}[H^+]$

$pH = -\log_{10}[11.3 \times 10^{-6}]$

$pH = 4.947$

66) $3.2 = -\log_{10}[H^+]$

$-3.2 = \log_{10}[H^+]$

$10^{-3.2} = [H^+]$

$6.310 \times 10^{-4} = [H^+]$

68) 10, that is why it is $\log_{10}$

See

$2 = -\log_{10}[H^+] \rightarrow [H^+] = 10^{-2} = .01$

$3 = -\log_{10}[H^+] \rightarrow [H^+] = 10^{-3} = .001$ ← 10 times