

ICM

Worksheet # 4

1. a.  $T(0) = 65 + 145e^{-0.05(0)} = 210^\circ\text{F}$   
 b.  $T(10) = 65 + 145e^{-0.05(10)} = 152.947^\circ\text{F}$   
 c.  $100 = 65 + 145e^{-0.05t}$   $t = 28.428$  minutes

2. a.  $T(t) = 60 + (98.6 - 60)e^{-.1947t}$   
 b.  $72 = 60 + (98.6 - 60)e^{-.1947t}$   $t = 6.001$  6 hrs

3.  $\frac{1}{2} = 1e^{-.008022t}$   $t = 86.406$  yrs

4.  $25000 = 17245e^{.0425t}$   $t = 8.738$  yrs

5.  $12000 = 8000e^{r(2)}$   $r = .20273 \Rightarrow 20.273\%$

6. a.  $3500(1 + .08875)^{3(1)} = \$4517.03$   
 b.  $3500(1 + .085)^{3(4)} = \$4554.44$   $\leftarrow 8\frac{1}{2}\%$  comp. quart.  
 c.  $3500e^{.0825(3)4} = \$4482.87$

7. a.  $P(t) = 5.2(1 + .016)^t$   
 b.  $p(10) = 5.2(1 + .016)^{10} = 6.095$  billion  
 c.  $8 = 5.2(1 + .016)^t$   $t = 27.138$  2017

8. a. 1 yr = 365 days  $P(365) = 40e^{-\frac{365}{400}} = 26.664$  watts  
 b.  $10 = 40e^{-\frac{t}{400}}$   $t = 1247.665$  days

9.  $2.1 = -\log[H^+]$   $H^+ = \boxed{.008}$

10.  $\text{pH} = -\log[1.2 \times 10^{-8}]$   $\text{pH} = 7.921$  basic

11.  $135 = 10 \log\left(\frac{I}{1 \times 10^{-12}}\right)$   $I = 31.623$

12.  $\text{dB} = 10 \log\left(\frac{10^{-4}}{1 \times 10^{-12}}\right)$   $\text{dB} = 80$

13. a.  $y = 171.462 * (.988)^x$   
b.  $106 = 171.462 * (.988)^x$       $x = 40.678$  mins  
c. 1 hour = 60 min  
 $y = 171.462 * (.988)^{60}$       $y = 84.352$  °F

14. a.  $y = 6.099 + 6.108 \ln x$

b. -

c.  $y = 6.099 + 6.108 \ln(20) = 24.398$  ft