HW TALLY →

Pick Up the Warm Up

and the list of ch.6 Test Items.

$$2^x = 80$$

$$\log(2^x) = \log(80)$$

$$x \cdot \log(2) = \log(80)$$

$$x = \frac{\log(80)}{\log(2)}$$

$$x \approx 6.322$$

$2^x = 80$ OR CONVERT directly to log form

$\log(2^x) = \log(80)$

$x \cdot \log(2) = \log(80)$

$x = \frac{\log(80)}{\log(2)}$

$x \approx 6.322$

$x = \log_2(80)$

Use change of base form

$x = \frac{\log(80)}{\log(2)}$

2 Saved \$15000. Invest 10,000 compo twice a year 10 years later

$F = 10000\left(1 + \frac{.072}{2}\right)^{2 \cdot 10}$

$= \$20,285.94$

$F = P \cdot e^{rt}$

Double your #
5.7%
continuous comp. interest

$2000 = 1000 \cdot e^{.057t}$

divide

$2 = e^{.057t}$

$2 = e^{.057t}$

$\ln 2 = \ln\left(e^{.057t}\right)$

$\ln 2 = .057t \cdot \underbrace{\ln(e)}_{1}$

$t = \frac{\ln 2}{.057}$

≈ 12.2 years

(8) $\sqrt{5}\ln(x) - \ln(x^3) = 10$

Questions on HW

① Condense

a) $\log(7) + x\log(3)$ b) $\ln(m) - \ln(n) - \ln(p)$

② Expand

a) $\ln\left(\frac{9x}{y}\right)$ b) $\log(mn)^3$ c) $\log 7(2x-3)^2$

(3) Determine the value in a bank account 20 years later of an initial investment of $4,000 assuming an annual interest rate of 6.5% and with monthly compounding.

repeat if compounding continuously. [use $F = P \cdot e^{rt}$]

(4) How long would it take to double your money with continuous compounding and an annual interest rate of 7%. (Use $F = Pe^{rt}$) Hint: make up any amount of $ to start with.

(5) Solve the equation

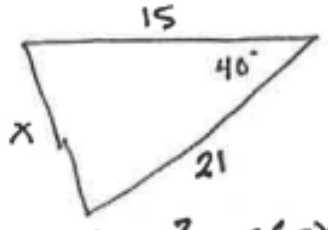
$$\ln(4r^2) = 3$$

(6) Solve $e^n = 5$

(7) Solve $2e^{x-5} = 80$

(8) $5 \ln x - \ln x^3 = 10$

(9) From Geometry



LAW of COSINES

$$x^2 = 15^2 + 21^2 - 2(15)(21)\cos 40^\circ$$

$$x^2 = 183.392\ldots$$

$$x = 13.54$$

(10)

Use your re

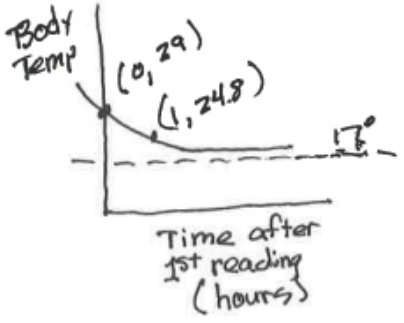
$n^2 = 16^2 + 23^2 - 2(16)(23)\cdot\cos(42^\circ)$

$n^2 = 238.045\ldots$

$n = 15.429$

(11) The Case of the Cooling Corpse (re-visited)
It turned out agent 008 made a mistake when measuring the temperatures. Instead of the initial reading of 27°, it was actually 29°C, and the reading 1 hour later was 24.8°C. The room temperature remember was 17°C.

a) Determine the general equation
b) Determine the time of death (Dr. Dedman died when his normal body temp was 37°C.)



(0, 29)

$29 = ab^0 + 17$ (−17)

$12 = ab^0$

$a = 12$

(1, 24.8)

$24.8 = ab^1 + 17$ (−17)

$7.8 = ab$

$7.8 = 12(b)$

$b = .65$

$y = 12(.65)^t + 17$

al body temp was 37°C.)

$37 = 12(.65)^t + 17$

$-17 \quad -17$

$20 = 12(.65)^t$

$\frac{20}{12} = .65^t$ convert to log form

$t = \log_{.65}\left(\frac{20}{12}\right)$

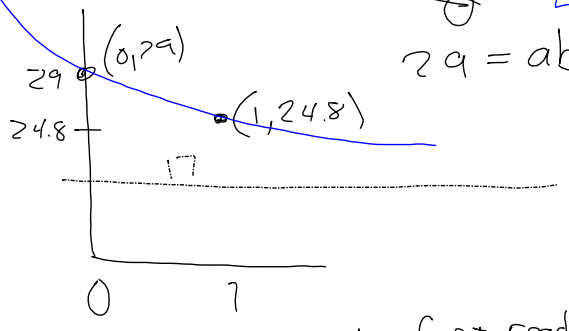
$t = \frac{\log\left(\frac{20}{12}\right)}{\log(.65)}$

≈ -1.1858 hours $\times 60$ min/hr

71. minutes before 5:05

so 3:54 pm is time of death

(11)



Time after the first reading (hrs)

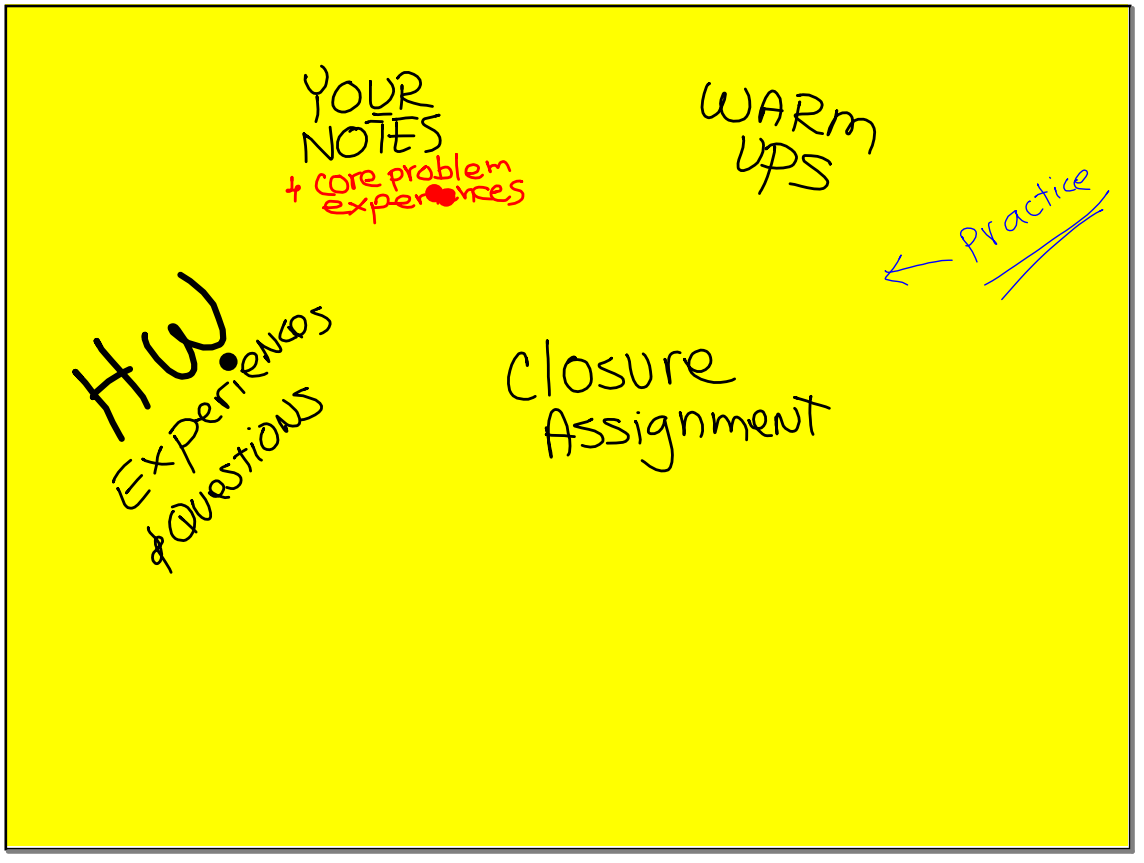
$24.8 = ab^1 + 17$

$29 = ab^0 + 17$

$7.8 = ab$

$12 = ab^1$

$a = 12$



Friday's assignment was the 8th assignment.

Homework Total ___/80

Have "it" ready before class starts.

Test Information Sheet

Agenda

1. Pre-learning Check for Ch. 7
2. In class- practice with logarithms & expential situtions
3. BB
4. Closure Assignment (Optional)

$$FV = PV\left(1 + \frac{r}{n}\right)^{nt}$$

$$FV = P \cdot e^{rt}$$

Logarithm Review

1) Rewrite each equation into either exponential or logarithmic form.

a) $\log_6 36 = 2$ — base = 6, exponent 2 — $6^2 = 36$

b) $\log_{289} 17 = \frac{1}{2}$ — $289^{\frac{1}{2}} = 17$

c) $12^2 = 144$ — exponent, base 12 — $\log_{12}(144) = 2$

d) $64^{\frac{1}{2}} = 8$ — $\log_{64}(8) = \frac{1}{2}$

2) Rewrite each expression as a single logarithm.

a) $\log 3 - \log 8$ — $\log\left(\frac{3}{8}\right)$

b) $\log 2 + \log 11 + \log 7$ — $\log(2 \cdot 11) + \log 7$ — $\log(2 \cdot 11 \cdot 7)$ — $\log(154)$

c) $4\log 3 - 3\log 4$ — $\log 3^4 - \log 4^3$ — $\log\left(\frac{3^4}{4^3}\right)$ — $\log\left(\frac{81}{64}\right)$

d) $\frac{\log 6}{3}$ — $\frac{1}{3}\log 6$ — $\log(6^{\frac{1}{3}})$ — $\log(\sqrt[3]{6})$

3) Find the value of each expression. can use change of base or other methods

a) $\log_3 3.3 = n$

$n = \frac{\log 3.3}{\log 3}$

≈ 1.087

b) $\log_2 30$

change of base

$\frac{\log 30}{\log 2}$

4.907

c) $\log_4 5$

1.161

4) Convert the log expression, $\log_2 30$, to one with only base 8.

5) Use log properties to solve each equation.

a) $\log(-2a+9) = \log(7-4a)$

$-2a + 9 = 7 - 4a$

$+4a \qquad +4a$

$2a + 9 = 7$

$-9 \quad -9$

$2a = -2$

$a = -1$

b) $\log x + \log 8 = 2$

condense

c) $-6\log_3(x-3) = -24$

divide by -6

$\log_3(x-3) = 4$

$3^4 = x-3$

$x = 3^4 + 3$

$x = 84$

d) $\log x + \log 7 = \log 37$

condense

6) Use log properties to solve each equation.

2nd method

Convert to log form, use change of base

a) $3^b = 17$

$\log 3^b = \log 17$

$b \log 3 = \log 17$

$b = \frac{\log 17}{\log 3}$

$b \approx 2.579$

b) $12^x = 13$

c) $5 \cdot 18^{6x} = 26$

$18^{6x} = \frac{26}{5}$

$\log 18^{6x} = \log\left(\frac{26}{5}\right)$

$6x \cdot \log 18 = \log\left(\frac{26}{5}\right)$

$6x = \frac{\log\left(\frac{26}{5}\right)}{\log(18)}$

$x = \frac{1}{6}\left[\frac{\log(26/5)}{\log 18}\right]$

$= 0.095$

d) $16^{n-7} + 5 = 24$

$-5 \quad -5$

$16^{n-7} = 19$

$\log 16^{n-7} = \log 19$

$(n-7)\log 16 = \log 19$

$n - 7 = \frac{\log 19}{\log 16}$

$n = \frac{\log 19}{\log 16} + 7$

Ch. 6 packet due before the test tomorrow. Be sure to write your totals at the bottom.

Assignment

CL6 - 149-153, 156, 158

check answers that follow

Also review your HW, warm ups, and notes