

**F.S.T.**  
**Homework 6-7**

Name \_\_\_\_\_  
Block \_\_\_\_\_ Date \_\_\_\_\_

*Rewrite as a linear function using  $\log y$ :*

1.  $y = 5.8(0.95)^x$

2.  $y = 1.08^x$

3.  $y = 14(1.6)^x$

*Write  $y$  as a function of  $x$ :*

4.  $\log y = -0.03x + 2.7$

5.  $\log y = 1.8x - 2.1$

6.  $\ln y = -3.5x + 4.6$

7. The table below shows the profits for several years, in thousands of dollars, of a company that produces computer software.

$x$ =years after 1982	0	2	4	6	8	10	12
$P$ =profits (thousands)	452	761	1218	2067	3582	5205	8349

- Make a scatter plot of the data pairs  $(x, \log P)$ .
- Write the linear regression equation for your scatterplot.
- Find an equation giving  $P$  as an exponential function of  $x$ .
- Use your equation to predict the profits for the company in 1998.

*Write  $y$  as a function of  $x$ .*

8.  $\log y = 3.4 \log x + 4.62$

9.  $\log y = -0.8 + 5.3 \log x$

10.  $\ln y = 4.5 \ln x + 6.2$

11. The table below shows the total U.S. energy consumption per capita (in millions of Btu) for selected years.

$t$ =years after 1950	5	10	15	20	25	30	35	40	42
$y$ =energy used ( $10^6$ Btu)	235	244	272	327	327	335	310	327	323

- Make a scatter plot of the data pairs  $(\log t, \log y)$ .
  - Write the linear regression equation for your scatterplot.
  - Express  $y$  as a function of  $t$ .
- d. Use the function you found in part (c) to predict the U. S. energy consumption in the year 1998.

12. The table below lists the estimates of expected life span for people of various ages.

Current Age (years)	Expected Life Span (years)		Current Age (years)	Expected Life Span (years)
1	76.2		45	78.6
5	76.3		50	79.2
10	76.4		55	79.9
15	76.5		60	80.9
20	76.7		65	82.3
25	77.1		70	84.0
30	77.3		75	85.9
35	77.7		80	88.3
40	78.1		85	91.0

- Draw a scatterplot of current age  $x$  versus expected life span  $y$ .
  - Use your calculator to draw scatterplots (statplots) using combinations of  $x$ ,  $y$ ,  $\log x$ , and  $\log y$ . Identify which scatterplot has a linear relationship.
  - Find the linear regression equation for the data pairs from part b that showed a linear relationship.
  - Rewrite your equation from part c to express  $y$  as a function of  $x$ .
- e. Use your model from part d to predict the life expectancy of a 48 year old.