Lab #5- Smoking & Taxes *Franz Helfenstein* Name

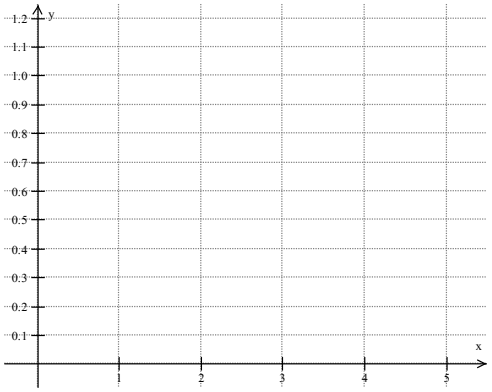
The year along with the corresponding average cigarette tax and approximate percentage of adolescents who smoke are shown in the table below.

Year	2000	2001	2002	2003	2004	2005
Tax	$0.52	$0.58	$0.64	$0.70	$0.85	$1.13
% Adolescents	28.7%	26.8%	24.8%	23.1%	19.8%	14.8%

1a) Considering Year vs Tax, which should be the <u>independent</u> variable?

1b) Considering Year vs Tax, which should be the <u>dependent</u> variable?

2) Is a <u>linear</u> or a <u>quadratic</u> model most appropriate for the relation between year & tax? Justify your answer.



3a) Let 2000 correspond with Year = 0.

Plot Tax vs. Year here and with the TI.
Label your axes.

3b) Run <u>Linear Regression</u> on this data. Enter your result here and in the TI. Plot and compare.

Tax(yr) = 0.112x + 0.46

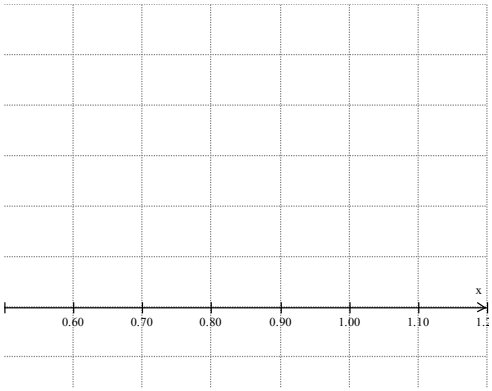
4a) Use your equation to predict the <u>cigarette tax</u> in 2010?

4b) Use your equation to predict <u>when</u> cigarette tax will reach $2.00 per pack?

5a) Consider Cigarette Taxes vs. Teen Smokers. Which should be the <u>independent</u> variable?

5b) Consider Cigarette Taxes vs. Teen Smokers. Which should be the <u>dependent</u> variable?

6a) Plot % Teen Smokers vs. Tax here and with the TI. Label your axes.



6b) Is a <u>linear</u> or a <u>quadratic</u> equation the best model for this data? Justify your answer.

7) Run <u>Linear Regression</u> on this data. Enter your result here and in the TI. Plot and compare.

%Teens (Tax) =

8a) Use your equation to predict the <u>% of teens</u> who will try smoking at $2.00/pack tax.

8b) Use your equation to predict the <u>cigarette tax</u> that will reduce teen smokers to 10%.

9a) Use your equation to predict the <u>cigarette tax</u> that will reduce teen smokers to 0.

9b) Use your equation to predict the % of teens who would smoke if there were no tax.

10) Use your equations to predict the % of teens who will smoke in 2010.

BONUS

Revenues = R = k·(Tax)·(%teens) where k = (avg # of packs smoked)·(total number of teens)

For simplicity, let k = 1. Plot R(tax). From a standpoint of maximizing State tax revenues from smokers, what is the optimum tax on a pack of cigarettes?