

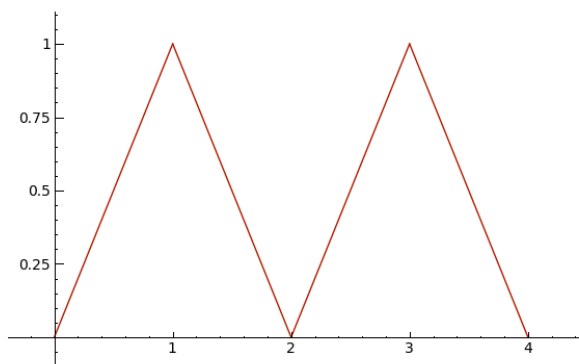
GRAPHING CALCULATOR PRACTICE

One of many nice things about a graphing calculator is that it can graph (duh) things pretty quickly.

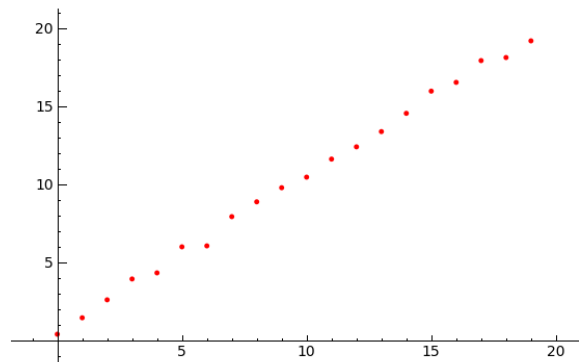
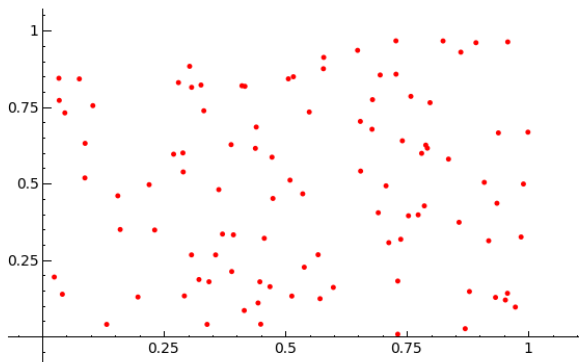
Problem 1 Let $y = f(x) = \sin x$. In words describes what happens to the first peak of the curve in the following cases

1. $y = f(x) + 2$
2. $y = f(x + 2)$
3. $y = f(x - 2)$
4. $y = f(x) - 2$
5. $y = f(-x)$
6. $y = -f(x)$
7. $y = f(2x)$

Problem 2 Using what you discovered above and the picture of $y = g(x)$ below, sketch $y = -g(-2x) + 2$.



A scatter plot is the plot of a bunch of data points. For example



Sometimes scatter plots have a recognizable general shape and sometimes they don't. Now you'll learn how to make a scatter plot and determine if they have some general shape (i.e., you'll be able to determine if they're somewhat linear or somewhat quadratic).

Here's what you do to get a scatter plot and lines and quadratics of best fit

1. Steps to enter ordered pairs and produce a scatter plot

- (a) Start the Data Matrix Editor
 - i. Type: Data
 - ii. Folder: main
 - iii. Variable: make a name
- (b) Enter the column of x-coordinates under C1
- (c) Enter the column of y-coordinates under C2
- (d) Display the Plot Setup Screen (F2)
- (e) Define Plot 1 as:
 - i. Plot type = Scatter
 - ii. Mark = Box
 - iii. x = C1
 - iv. y = C2
- (f) Save the plot definition and return to Plot Setup Screen (ENTER ENTER)
- (g) Display the Y= Editor (<GREEN DIAMOND> F1)
- (h) Clear any existing equations (e.g., those from the first page)
- (i) Use ZoomData to graph Plot 1 (F2 9)

2. Steps to compute and display the line of best fit

- (a) Start the Data Matrix Editor on the 'current' data set (APPS)
- (b) Enter the Calc Menu (F5)
 - i. Calculation Type: LinReg (Item 5 Enter)
 - ii. x = C1
 - iii. y = C2
 - iv. Store RegEQ to: y1
- (c) Save Calc Information (ENTER)
- (d) Read the slope (a), intercept (b) and R^2 on the display. Make note of each of them (i.e., write them down). When done press ENTER

- (e) Display Y= Editor (<GREEN DIAMOND>F1)
 - (f) Use ZoomData to graph Plot 1 (F2 9)
3. Step to compute and display the quadratic of best fit
- (a) Start the Data Matrix Editor on the 'current' data set (APPS)
 - (b) Enter the Calc Menu (F5)
 - i. Calculation Type: QuadReg (Item 9 Enter)
 - ii. $x = C1$
 - iii. $y = C2$
 - iv. Store RegEQ to: y1
 - (c) Save Calc Information (ENTER)
 - (d) Read the coefficients a, b, and c. Note the R^2 . Write these four numbers down
 - (e) Display Y= Editor(<GREEN DIAMOND>F1)
 - (f) Use ZoomData to graph Plot 1 (F2 9)

Problem 3 Enter the following data

1980	338.5
1982	341.0
1984	344.3
1986	347.0
1988	351.3
1990	354.0
1992	356.3
1994	358.9
1996	362.7
1998	366.7

into your calculator and find the line and quadratic of best fit. From this determine if the data is better described by a linear or quadratic polynomial. Write down the coefficients a and b for the linear function and the R^2 ; write down the coefficients a, b and c for the quadratic function and the R^2 value. Keeping in mind that an R^2 closer to 1 means a better fit and keeping in mind what this model is trying to describe, which curve (the quadratic or the line) is the better approximation. Justify your answer with reasons not just based on the R^2 .