



In Class Exercises (ICE) - 3/2/01

Where is the coldest place in earth? In 1997, a temperature of -91°C was recorded at Vostock Base on the Antarctic continent (see Figures 1¹ and 2²). This is the lowest temperature ever recorded.



Figure 1: Map of the Antarctic continent showing location of Vostock Base.



Figure 2: Antarctic lanscape. (The buildings are a research facility.)

Some data on the climate of the area around Vostock Base is given in Table 1 below (the numbers are the average temperatures in $^{\circ}\text{F}$).

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
-25.7	-47.6	-72.1	-84.4	-86.0	-85.3	-88.3	-89.6	-86.7	-70.7	-45.8	-25.7

Table 1: Average monthly temperatures in Vostock, Antarctica³.

In this ICE, your job is to use this data to create a function that can be used to estimate the temperature in Vostock on any given day.

- Based on what you learned from the ICE on Algeria, use the data in the table to make an educated guess of what the relationship between temperature and time might be.**

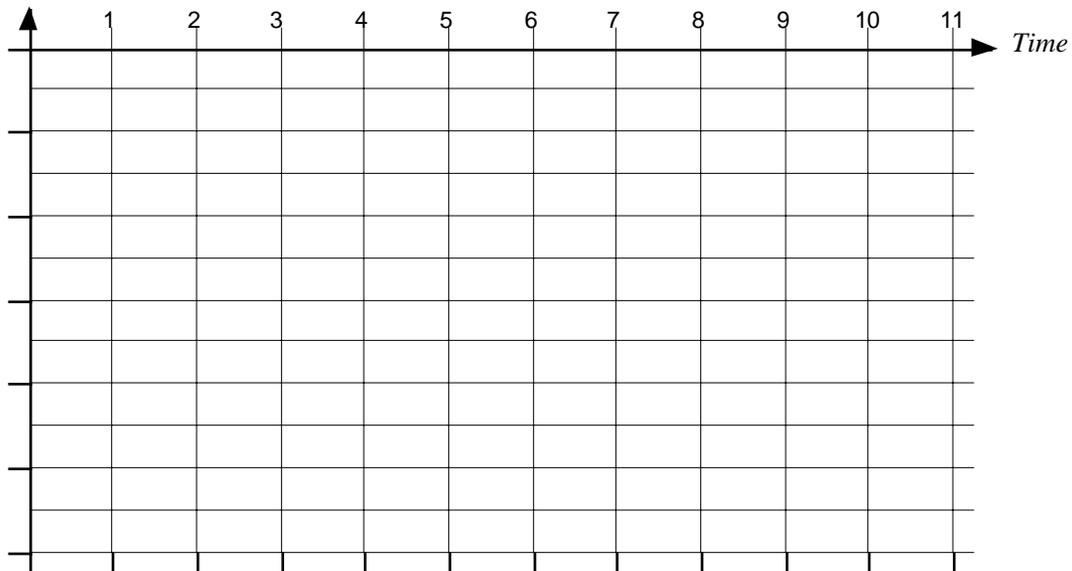
¹ Image source: National Geographic Society.

² Image is a portion of a photograph made by Richard Brown, University of Minnesota.

³ Source: www.worldclimate.com

- Use the data in Table 1 to plot a graph that shows temperature versus time. Plot a graph of the function you found. Does this function do a good job of approximating the data or not?

Temperature



- What patterns do you see in this graph? Would you expect these patterns to be repeated? Decide what quantities you would have to specify in order to describe these patterns with numbers, and then use your graph to find these numbers. How are these numbers related to the constants that appear in your function?

- Enter the data into the “L1” and “L2” lists of your calculator (see Figure 3 below), and then run the SinReg routine on your calculator (see Figure 4). What do the outputs of this routine mean, and how are they related to the graphs you have drawn?

L1	L2	L3	1
0	-25.7	-----	
1	-47.6		
2	-72.1		
3	-84.4		
4	-86		
5	-85.3		
6	-88.3		

L1(t)=0

Figure 3: Enter data into L1 and L2.

CALC TESTS	EDIT TESTS
1:Edit...	7:QuartReg
2:SortA(8:LinReg(a+bx)
3:SortD(9:LnReg
4:ClrList	0:ExpReg
5:SetUpEditor	A:PwrReg
	B:Logistic
	SinReg

Figure 4: Press [STAT], choose the [CALC] option and then scroll down to find [SinReg].