Modeling Middle Fork of the Salmon River Flow **Name(s):**

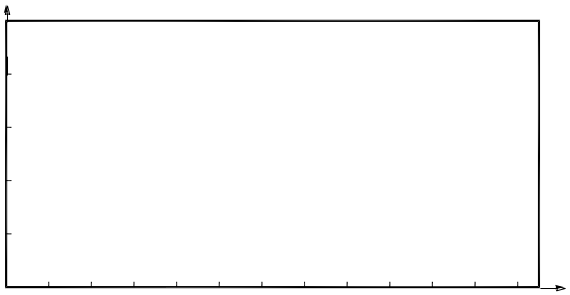
Middle Fork of the Salmon River Daily Mean Discharge (cfs)

- GAGE LOCATION--Lat 44° 43'18", long 115° 00'59", Boise National Forest, on left bank at Middle Fork Lodge, 300 ft upstream from Middle Fork Lodge bridge, at mile 61.0. Elevation of gage is 4,380 ft above NGVD of 1929
- DRAINAGE AREA--1,040 mi^2, approximately.
- EXTREMES FOR PERIOD OF RECORD--Maximum discharge, 20,900 ft^3/sec. June 16, 1974,

2005 Mean Stream Flows

DATE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	440	386	438	528	2,000	4,540	1,670	771	488	479	490	445
15	350	325	518	734	2,980	2,360	1,040	571	480	466	387	414
MAX	561	453	721	2,570	7,390	4,540	1,670	771	570	541	670	1,020
MIN	290	270	411	528	2,000	1,790	734	483	458	438	385	287
AVG	425.5	361.5	566	1549	4695	3165	1202	627	514	489.5	527.5	653.5

1) Enter the average data into your calculator and create a scatter plot of the data. Draw a sketch here →



Use Jan 1 = 0, Feb 1 = 1, Mar 1 = 3, etc.

π [0, 24] × [0, 5000]

2) Find a mathematical model for this relationship using the calculator's SinReg and store the results in Y_1.
Format: SinReg *iterations*, XList, YList, *period, output eqn* *(italics = optional)*

3) Using yearly max and min to determine the amplitude and vertical shift, a 12 month period to find b and the location of the max (or min) to determine the horizontal shift, find a mathematical model. Keep π in your answer. Write that here and store the results in Y_2.

4) Which model seems to be a better predictor of the mid month flows?

5) Which model seems to be a better predictor of the yearly min/max?

6) Change your window to cover 5 years and plot the 1 year data, Y_1 & Y_2. Which do you feel is the better model overall for this 5 year period? Why?