

# Math 1613 - Trigonometry

## Written Assignment 4 - Due 2019.06.30

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Directions: Please answer the following question in complete sentences. Be sure to label all geometric objects in any illustrations (if any). I will accept an answer in a scanned image format, as a pdf, or as a picture taken and sent from your awesome smart phone.

Question: The following table contains the monthly average hi and low temperatures for Durant, Oklahoma over the course of the year<sup>[1]</sup>.

Month	Average Low	Average High
January	30	53
February	33	57
March	41	65
April	48	74
May	59	81
June	67	88
July	71	93
August	70	94
September	62	87
October	50	77
November	40	65
December	31	55

- (a) Predict the average yearly high and low temperatures, and compare those results to those listed in the reference.
- (b) Plot the average monthly high and low temperatures on separate graphs over a two-year period, letting  $x = 1$  correspond to January of the first year.
- (c) Determine functions of the form  $f(x) = a \cos(b(x - d)) + c$  where  $a, b, c,$  and  $d$  are constants, that models the data. (You need one for each, done independently).
- (d) Graph the functions together with the data on the same coordinate axes.
- (e) Describe the fit of your functions to the data.

[1] <http://www.usclimatedata.com/climate/durant/oklahoma/united-states/usok0165>