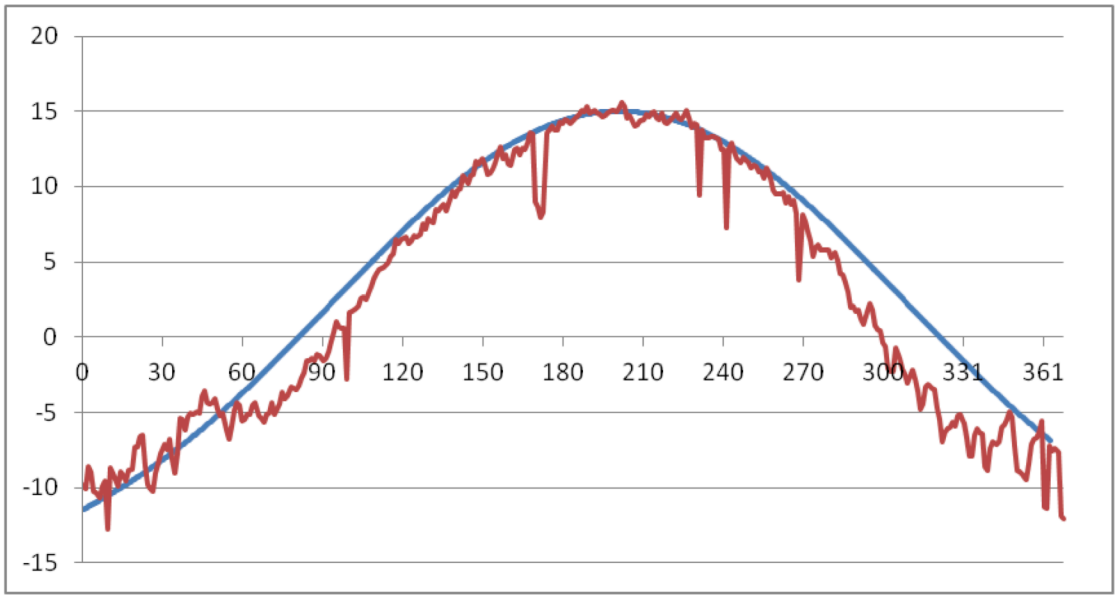
Polynomials 5 – Polynomial Inequalities **Name** _____
Homework #10 **Per** _____ **Date** _____

1. The Daily Average Temperature in Anchorage, Alaska, in degrees Celsius, was recorded from 1995 to 2012[1]. The average (over the 17 year period) for each day was then computed and plotted on the graph below (the jagged graph), beginning on January 1 and ending on December 31. A polynomial graph (T) approximating the jagged graph was then superimposed on the same set of axes (the smooth graph). The formula for the polynomial is given by $T(d) = Ad^6 + Bd^4 + Cd^2 + E$ for certain values of A, B, C, and E, and where d represents the number of days after Jan.1 (i.e. Jan. 1 corresponds to t = 0). Thus, if the values for A, B, C, and E are known, T can be used to compute the expected temperature on each day of the year, which can then be used, for example, to compute the amount of energy needed for heating. Use the graph of T to answer the questions below.

The Average Daily Temperature in Degrees Celsius for Anchorage, Alaska for a period of one year



a. What is the approximate temperature on January 1? _____

b. Approximately what month of the year has the highest average temperature? _____

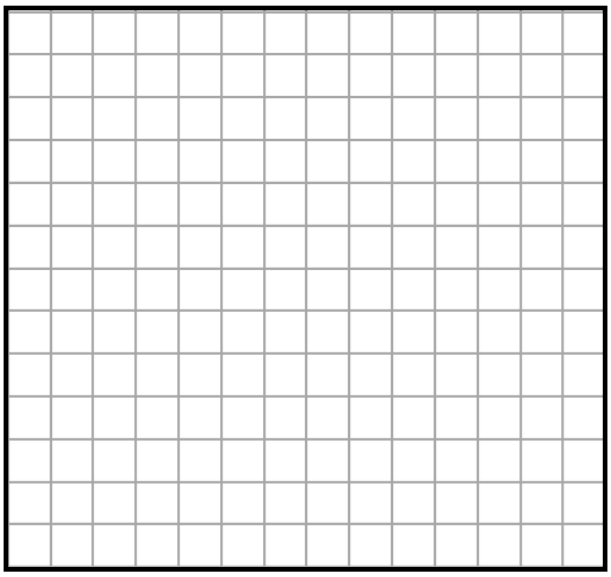
c. What is the first month of the year in which the average temperature rises above zero for most of the month?

d. During approximately what days was the average temperature above freezing (zero degrees Celsius)?

[1] Data is from the Global Summary of the Day (GSOD) database archived by the National Climatic Data Center (NCDC). See for example, http://www.ncdc.noaa.gov/most-popular-data for free online data.

2. Determine the solution to the inequality
$x(x-3)(x+2)<0$

Determine the solution **graphically** and represent the solution in a notation of your choice



3. The graph below shows a cubic function $f(x)$ and quadratic function $g(x)$.

a) State the solution for $f(x) = g(x)$

b) State the solution for $f(x) \geq g(x)$