9. (*expires 2/27*) Given the set of points

$$(0,3),(1,0),(2,4),(3,4),(4,-1),(6,4),(7,0),(9,2),(10,10),$$

Find the polynomial of degree 8 that passes through all of them. If you wish, you can use `CurveFitting[PolynomialInterpolation]`, or you can calculate all of the relevant equations.

Then find the polynomial of degree 9 which passes through these points and also has a critical point at $x = 6$, and the polynomial of degree 10 passing through the points with critical points at both $x = 1$ and $x = 6$.

Finally, make a plot displaying all three graphs, together with the data points.

If you don't want to type the points, you can load them from the web at `http://www.math.sunysb.edu/~scott/mat331.spr14/problems/polydata.txt`, which defines a list called `polydata` containing these points.

10. (*expires 2/27*) Using the same data as the previous problem, find the "natural" cubic spline which interpolates the data. Also calculate the cubic spline which has derivative 0 at $x = 0$ and $x = 10$, and make a plot showing the data points and these two curves on the same axes. (You will probably have to read the help page on Spline Continuity and End Conditions to see how to adjust the derivatives at the endpoints.)

11. (*expires 2/27*) In class on February 11, we created a graph with an interactive slider control.

Write a maple worksheet with one or more interactive controls that does the following:

(i) Given a function $base(x)$, generate a list of points $(i, base(i))$ for integer i, $0 \le i \le 10$.

(ii) Find the interpolating polynomial of least degree which passes through the points in the above list and also the point (a, b).

(iii) Find the cubic spline which passes through the points in the above list and also the point (a, b).

(iv) Plot the data points (including (a, b)), together with the interpolating polynomial and the cubic spline on the same graph.

(v) There should be an interactive control which allows the user to adjust both the x- and y-coordinates of the point (a, b) and the plot should should automatically update itself as the point is adjusted.

To help you get started, there is a worksheet called sliderfit.mw containing just the relevant parts from that class.