**Introduction to Polynomials Activity**

**Objective:** Students will examine several different types of polynomials and make conjectures about how the degree of a polynomial affects its domain, range, x-intercepts, turning points, and end behavior.

1. Each group needs to cut out one set of graphs.
2. Sort the functions in piles by degree.
3. Work together to fill in the pieces below each graph.
4. Answer the questions in the packet as a group (but everyone needs to have their own answers filled in).

***Domain***

1. What do you notice about the domains of:
   1. the linear functions?
   2. the quadratic functions?
   3. the cubic functions?
   4. the quartic functions?
2. Make a conjecture about the effect of the degree of a polynomial on its domain.

***Range***

1. What do you notice about the range of:
   1. the linear functions?
   2. the quadratic functions?
   3. the cubic functions?
   4. the quartic functions?
2. Make a conjecture about the effect of the degree of a polynomial on its range.

***Number of X-Intercepts***

1. What do you notice about the # of x-intercepts of:
   1. the linear functions?
   2. the quadratic functions?
   3. the cubic functions?
   4. the quartic functions?
2. Make a conjecture about the effect of the degree of a polynomial on the number of x-intercepts it has.

***Number of Turning Points (max’s and min’s)***

1. What do you notice about the # of turning points of:
   1. the linear functions?
   2. the quadratic functions?
   3. the cubic functions?
   4. the quartic functions?
2. Make a conjecture about the effect of the degree of a polynomial on the number of turning points it has.

***End Behavior***

1. What do you notice about the end behavior of:
   1. the linear functions?
   2. the quadratic functions?
   3. the cubic functions?
   4. the quartic functions?
2. Make a conjecture about the effect of the degree of a polynomial on its end behavior.

***Synthesis***

1. Without graphing, write a few sentences describing what you would expect the graph of following polynomial to look like. Be sure to describe all 5 characteristics that you investigated in this activity.

y = –2x5 + 3x4 – x3 + 2x2 + 1