**Bounce, Wiggle, Cross**

Directions:

1. Use the following window values:

[x min,x max] = [-3, 4] [y min,y max] = [-100, 100] yscl = 0

1. Graph each f(x) on your calculator.
2. Sketch the graph on the chart. Do not worry about the scale. We are only interested in the end-behaviors and the behavior at the x-intercepts.
3. Fill in the remaining columns of the chart based on the information you see on your graph.

After completing the table:

1. Look at each root where the graph of f(x) “crossed” the x-axis. What was the power of the corresponding factor?
2. Loot at each root where the graph of f(x) wiggled at the x-axis. What do you notice about the power of the corresponding factor?
3. Look at each root where the graph of the f(x) is tangent or bounced at the x-axis. What do you notice about the power of the corresponding factor?
4. If f(x) has the highest powered term axn, describe the end behavior of the f(x) in each of the following situations:

a>0, n is even: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a< 0, n is even: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a>0, n is odd: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a< 0, n is odd: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Bounce Wiggle Cross Extension**

Calculus Connection:

A particle starts at time t = 0 and moves along the x-axis so that it’s position at any time t≥0 is given by the x(t) = (t – 1)3(2t – 3).

For what values of t is the velocity of the particle less than zero?

(Hint: factor the algebraic expression, then sketch a quick sketch using the x-intercepts and the behavior of the exponents to find where the function is <0)

V(t) = 2(t – 1)3 + 3(t – 1)2(2t – 3)