GUIDED NOTES: BOUNCE WIGGLE CROSS

Directions:

1. Use the following window values:
   i. [x min, x max] = [-3, 4] [y min, y max] = [-100, 100] yscl = 0
2. Graph each f(x) on your calculator.
3. 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.
4. 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. Look 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 ax^n, 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: _____

EXTENSION: BOUNCE WIGGLE CROSS

Calculus Connection:

A particle starts at time t = 0 and moves along the x-axis so that its position at any time t≥0 is given by:

$x(t) = (t - 1)^3(2t - 3)$.

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.)

$V(t) = 2(t - 1)^3 + 3(t - 1)^2(2t - 3)$