Pathways Reading Guide M5 Section 5 Part 2
Graphing Polynomial Functions

Please read Module 5, section1 in your e-book, pp. 46 – 54. (Click on Module 5, then "text.")

Be sure to *read with a pencil in hand* and attempt the examples before you read the solution given. Take notes of important definitions and ideas as you read. I don't expect you to have 100% comprehension of everything in the section, but spending significant time trying to understand the main ideas will assist you as you work on the Investigation during our next class.

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END BEHAVIOR OF POLYNOMIAL FUNCTIONS

The introduction to End Behavior on the bottom of page 46 and top of page 47 is good. Study the definition then do the following activity.

1. Plot the polynomials $P(x)=2x^3+9x^2+x-12$ and $Q(x)=2x^3$ on the same grid on your graphing calculator. Use the viewing window [-8, 8] by [-15, 15]. Describe the differences in the two graphs. Describe any similarities as well.
2. Go to TABLE SETUP. Let TblStart t= 0 and ΔTbl=1 ; Indpnt: Auto; Depend: Auto. Press 2nd GRAPH.
   Compare the values of Y1 and Y2 when *x* is close to 0, say between -5 and 3.
3. Now set your viewing window to [-50, 50] by [-5000, 5000] and press GRAPH. What do you notice about the two graphs now?
4. In the TABLE SETUP menu, let TblStart = 0 and ΔTbl=200. Now press 2nd GRAPH and compare the values of Y1 and Y2. What do you notice when the values of *x* get very large in either the positive or negative direction?
5. In Y3=, type in $9x^2+x-12$ (the last three terms of the original polynomial). Go to the table and note how the values in Y2 compare to the values in Y3 when *x* is close to 0….then when x is huge in either the negative or positive direction. What do these values tell us about the leading term?

Then read pp. 47-48 carefully and study the boxed-in comment on page 48.

What is a power function?

Can you characterize the graphs of power functions of even degree? Of odd degree? Study the notation in the middle of page 49 (after the graphs) until it makes sense to you. Send your instructor an email if you do NOT get it.

Continue reading the examples up to the summary on the top of page 54. You will need to know how to find the end behavior of the graph of a given polynomial function. You will probably find the video on p. 54 helpful as you try to do this.

Your instructor will discuss with you the "Graphing Polynomials" section, but it wouldn't hurt for you to study the part about using the number line (p. 56) to figure out the behavior of the graph between zeros.